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PRACTICAL AND SCIENTIFIC NOTES.

By John M. Maisch.

Preservation of Gum and Starch Paste. The paste made by gum tragacanth and gum arabic, which is so extensively used by the apothecaries in this country, acquires, particularly during the warm season, a very unpleasant and even offensive odor in consequence of fermentation, which soon commences on exposure to the air. Oil of cloves, alum and other essential oils and salts are frequently added to counteract this tendency, with but partial success, the volatile oils merely hiding to a certain degree the offensive odor developed, and retarding the fermentation incompletely. For some time past I have availed myself of the antiseptic property of creasote, which may be added to these pastes recently made, until its odor is faintly apparent. The result is their perfect preservation, no offensive odor being disengaged, and their adhesiveness is not impaired by keeping them for months.

Fluid extract of Colchicum Seed. Before it had been adopted for the present Pharmacopœia, and while engaged with Dr. E. R. Squibb, of Brooklyn, N. Y., I have made considerable quantities of this fluid extract, and have found that the formula, as it now stands, is the best in its results. On examining the finished preparation, it will be observed that it is turbid, and it cannot be obtained clear by filtration through a dry or moistened filter. The only method to obtain it in a clear state, is to

allow it to stand undisturbed for several days, when it will be found to have separated into two layers, the upper of which is of a greenish brown color, and oily in its nature. This is to be separated by syphoning off one stratum, and by means of a separatory funnel.

From 188 lbs. avoird., we obtained, at the U. S. Army Laboratory, six pints of this oil, which I intend to examine as soon I can find the necessary time for doing so. Meanwhile, I may state the result of a few experiments made with it.

Two pints were introduced into a glass retort with a thermometer inserted, and a carefully regulated heat was applied. The oil commenced to boil at 184° F., at which point the temperature was kept for some time; but when boiling had almost entirely ceased, the temperature was allowed to rise gradually. Boiling recommenced briskly at 186°, and the temperature rose within two and a half hours to 196°. During all this time alcohol distilled over; the concussions finally became so violent that the distillation had to be discontinued. The alcohol measured 10 fluidounces, had at 65° a specific gravity of .850, and was almost free from foreign odor. The remaining oil was of the original color, only a shade darker; its specific gravity at 60° is .9069; it dissolves almost in all proportions in alcohol of .850 and below, but is very sparingly soluble in diluted alcohol. From the manner in which it has been originally obtained, it is evident that it has the property of taking up some stronger alcohol when left in contact with diluted alcohol. When agitated with solution of ammonia, it forms a soft, pasty compound.

Veratrum viride. One hundred pounds of corms and roots of this plant were received, nearly every specimen of which had a portion of the dead stalk attached to it. I had the latter cut off, using only corms and rootlets in the preparation of the fluid extract. The stalks, weighing 11½ lbs., I intended to utilize by preparing veratria from them. I boiled them twice in water acidulated with sulphuric acid, expressing strongly each time. The liquid was concentrated by evaporation and treated with strong alcohol, when a copious precipitate was obtained, which contains a body analogous to saponin, if not identical with it; for its watery solution froths considerably. The alcoholic solution was treated with slacked lime, and a portion

of the filtrate which ought to have contained the veratria was evaporated, the residue taken up with water acidulated with a little muriatic acid, and tested with phosphomolybdic acid and with iodohydrargyrate of potassium; both reagents had no effect. Astonished at the unexpected result, I exhausted some of the lime precipitate by boiling alcohol, and treated the filtrate in the same way; I likewise tested the solution of the precipitate caused by alcohol, but without any better result.

It is evident, therefore, that the dead stalks of Veratrum viride contain no alkaloid, and their careful removal previous to preparing the fluid extract is indispensable. If time permits, I shall try to isolate the saponaceous principle.

Solanum pseudocapsicum. During last fall I gathered from this shrub some berries, which are commonly known by the name of Jerusalem cherries. The following are the results of some preliminary experiments, instituted previous to an intended analysis, for which, however, I have not yet found the time. When the ripe berries are treated with water, a lemon-yellow, slightly turbid liquid is obtained, which has an acid reaction, and is not disturbed by iodohydrargyrate of potassium, except after considerable concentration. It was supersaturated with carbonate of soda and agitated with ether, which, on spontaneous evaporation, left a light orange-yellow mass, consisting, most probably, in part of coloring matter. A portion of it was dissolved in muriatic acid, and now gave evidence of the presence of an alkaloid by causing precipitates when treated with Mayer's and Sonnenschein's tests. The behaviour of this impure alkaloid towards some tests is as follows:—Nitric acid produces no alteration; sulphuric acid causes a brown, afterwards black color; bichromate of potassa and sulphuric acid develops gradually a green color in consequence of the reduction of chromic acid to the oxide.

Several cases of poisoning by Jerusalem cherries have been reported; it is to be presumed that this alkaloid is the poisonous principle.

The pulp, which had been exhausted by water, was treated with strong alcohol, which acquired a beautiful orange color; the treatment was continued as long as the alcohol was colored,

but the epidermis of the berries retained its original red color. The residue was now digested with aqueous and with alcoholic solution of potassa, which, however, appeared to have no effect on the coloring matter.

Philada., January, 1864.

COMPOUND SANTONIN LOZENGES.

The following receipe has been furnished to us for publication as that used by Mr. Fougera, of New York, in making his "Dragées de Santonine Composées" used as a Vermifuge.

	Grammes.
R. Santonin,	25·00
Jalapin,	10·00
Pulv. Gum Arabic,	30·00
Chocolate, pure,	60·00
White Sugar,	160·00
Water, q. s. about,	15·00

Make a pilular mass, divide into one thousand pills and coat with sugar. Latterly, jalapin has been replaced by the resin of gamboge, owing to the scarcity of the former.

IMPURITIES AND ADULTERATIONS.

Noticed at the U. S. Army Laboratory, Philadelphia.

By Jno. M. Maisch.

(Read at the Pharmaceutical Meeting of the College, Feb. 1, 1864.)

It is well known that stones and bullets are occasionally met with in crude opium; they are, however, so few in number, that their presence must be ascribed rather to accident than to design. Lately, we received from one of the medical purveying depots a parcel of opium mostly done up in half and one pound packages, and some in the original cakes evidently unbroken; one of the latter, previous to being rolled out to prepare it for drying, was broken and found to contain within the space of a few cubic inches, not less than sixteen lead bullets, weighing probably $7\frac{1}{2}$ ounces. These have evidently been incorporated for the fraudulent purpose of increasing the weight. I have no means to ascertain whether other or all the cakes of the same case were rendered heavier by the same means.

Buchu may be occasionally found in commerce mixed with green portions of the stem, the flowers, and sometimes capsules of the Barosma. A bale of the short-leaved variety which I prefer for pharmaceutical preparations owing to the larger amount of volatile oil it contains, was found mixed with about five per cent. of the ripe capsules and seeds, but was free from stems and flowers; the capsules are nearly inodorous but have a hot aromatic taste; the seeds have but a very slight taste of buchu and are odorless. At another time, a bale of the medium sized leaves were found to contain in the centre some large stones weighing about ten pounds.

Simple Cerate. A large lot of simple cerate which had been furnished to one of the medical purveying depots previous to the establishment of the laboratory, had turned rancid in a short time. On examining it, I found it to be of a uniform texture, apparently of nearly the proper consistence, but becoming readily soft by the warmth of the hand; it had a somewhat diaphanous appearance and dissolved readily and completely in ether at the ordinary temperature. It was made from lard and Japan wax, which latter, it will be remembered, is a true fat consisting chiefly of palmitin, and consequently soluble in cold ether, while the same solvent takes up but traces from true beeswax.

Lard. In this connection I may mention our experience with lard, which was procured from a large manufacturer in this city. In the preparation on a large scale of the officinal Ceratum Adipis there was repeatedly obtained water amounting to from 12 to 15 per cent. of the weight of the lard employed. On remonstrating with the manufacturer, he freely acknowledged that he added one-eighth of water to render the lard white. I had on former occasions become acquainted with this practice; the water is kept in intimate mixture with the fat by the addition of a little carbonate of potassa or borax. But ever since that time we have had no difficulty in procuring excellent lard free from all water.

Copaiva. A small sample of copaiva was sent to the laboratory for examination. It was of about the consistence of olive oil, turbid in appearance and possessed an odor distinctly terebinthinate beside the copaiva. Treated with eight parts of 95

per cent. alcohol only a portion of it dissolved while an oily liquid gradually separated at the bottom of the test tube. This sediment was again treated with 200 times its volume of strong alcohol, with which it yielded a turbid mixture, gradually separating an oily layer, which produced upon paper a stain easily recognized as greasy and quite distinct from resinous. A portion of the so-called copaiva was slowly evaporated at a moderate heat; the odor developed at first was more like copaiva, but subsequently quite distinct and terebinthinate; the residue was perfectly transparent, liquid, had a bland, afterwards acrid taste, and formed with caustic potassa and ammonia a milky mixture. From these experiments, I pronounced the copavia adulterated with a fixed oil and probably some terebinthinate oleoresin.

Castile Soap. A sample of mottled Castile Soap had a somewhat suspicious appearance; the color of the body of soap was the of a dirtier brown than usual, the intermixed oxide of iron had a dull reddish brown color only on the outside of the bar, while the interior retained its black color for four weeks. 200 grains of it in its commercial state without previous desiccation, were incinerated; the ashes weighed 90 grains, which shows the enormous amount of 45 per cent. of inorganic constituents aside from the water. The ashes were but partly soluble in water, and the solution contained soda, a little potassa, carbonic and some muriatic acid; the solution was evaporated to dryness in the presence of muriatic acid and the residue taken up with acidulated water, when a trace of silica remained undissolved; it was entirely free from lime and sulphuric acid.

The undissolved portion was partly soluble in nitric acid and this solution afforded abundant evidence of the presence of lime; no sulphuric acid was found, but on supersaturating with ammonia, a dense white precipitate appeared again. I did not go any further for want of time to ascertain whether the portion dissolved by nitric acid was phosphate of lime or not.

That portion of the ashes which had not been taken up by water and cold nitric acid, was fused with pure carbonate of potassa, which combined with some silica, leaving a portion of lime and oxide of iron behind.

200 grs. of the soap was dissolved in boiling 85 per cent.

alcohol, the hot solution thrown upon a filter and the filter washed with hot alcohol; the undissolved portion after washing and drying weighed 47·5 grains, was of a brownish grey color and free from organic compounds. The alcoholic filtrate, measuring five fluidounces, solidified on cooling to a transparent mass like opodeldoc.

These experiments prove that this so-called Castile soap has been made of animal fat and was probably adulterated with some silicate of soda, which must have been decomposed again by the lime; but for what reason and in which form the lime had been added, I cannot conceive; it did, however, as will be seen from the foregoing experiments, not interfere with the detergent properties of the soap, acting merely as a diluent.

Philadelphia, January, 1861.

EXTRACTS FROM GERMAN JOURNALS.

By Geo. J. Scattergood.

On the detection of alcohol in volatile oils.—The employment of sodium as a means of detecting alcohol in chloroform has suggested to Dragendorff, the use of this reagent in ascertaining the presence of alcohol in volatile oils. Upon placing a small piece of sodium in perfectly pure non-oxygenated volatile oil, no other change takes place at first than the disengagement (in some cases only) of a few bubbles of gas, due probably to a small amount of water, which some of these oils may contain. After the lapse of some hours or of some days, exposed in an uncovered test tube, the sodium becomes covered with a brownish, resinous coating, while the oil retains its original color. When, however, the sodium is brought into contact with an oil containing but a few per cent. of absolute alcohol, a lively disengagement of gas is at once perceived; in the course of which the pieces of sodium are brought to the surface of the liquid. Upon the addition of the sodium a milkiness is almost immediately produced in the oil, which always disappears, and the oil sooner or later acquires a yellow color. After some hours, and often after some minutes, only the oil containing alcohol becomes brown, and much less fluid, and in some cases so thick as not to flow out of the tube when inverted. By these reactions, Dragendorff was able to

detect in non-oxygenated oils a very small amount of absolute alcohol, (5 to 10 per cent.) The admixture of 3 to 5 per cent. of castor oil, poppy, or sweet oil, does not affect these reactions.

If the oil has previously become somewhat resinified, the oil may remain colorless, but the pieces of sodium will become covered sooner—in 5 to 10 minutes—with the resinous coating, which may be separated from the sodium by shaking. In unresinified oils this does not take place for 18 to 24 hours, and in many cases a method is thus furnished for ascertaining whether resinification has taken place. Even in volatile oils, containing oxygen, the behavior towards sodium affords a more or less accurate test for the presence of alcohol. Disengagement of gas, cloudiness, and subsequent browning and thickening being produced upon the addition of sodium to such oils contaminated with alcohol. In the pure oils this coloration is not produced for some hours. The author has applied this method of testing successfully to many of these substances, in ordinary use, among which are oil of turpentine, lavender, rosemary, caraway, bergamot, distilled and expressed lemon, peppermint, sassafras, cubebs, mace, origanum, cajeput, fennel, orange-peel, wintergreen, rose, anise, cassia, cloves, copaiba, savin, &c. &c.—(Pharm. Zeit. f. Russland, in Vierteljh. für prak. Ph. Bd. xiii. p. 26)

On Freezing Mixtures.—Joseph Hanamann (Vierteljahres. f. prak. Ph. B. xiii. p. 3,) gives a series of interesting results upon the degree of cold produced by the sulphates, chlorides and nitrates of the alkalies, upon solution in water. These salts, in a finely divided, crystalline, chemically pure state, were dissolved in equal weights of water, kept at an uniform temperature with the following results:

Name of salt.	*Temperature at Mixing.*	*Decrease of Temperature.*	*Time in Reaching Lowest Temperature.*
Sulphate Ammonia	62° Fahr.	14° Fahr.	45 seconds.
Chloride ammonium	62° "	25° "	40 "
Nitrate ammonia	62° "	45° "	30 "
Sulphate potassa	66° "	8° "	60 "
Chloride potassium	64° "	21° "	45 "
Nitrate potassa	62° "	18° "	45 "
Sulphate soda	64° "	13° "	30 "
Chloride sodium	62° "	7° "	
Nitrate soda	62° "	17° "	30 "

From this series, the average results of which only are given above, this observer concludes:

1st. The rapidity with which the temperature is lowered is in direct proportion to the solubility of the salt.

2d. The ammonia salts produce the greatest cold, next the potash salts, and then the soda salts.

3d. Reduction in temperature is greater when increased quantities of salt and water (in the same proportion) are employed,—in the ammonia salts; is unaffected by the amounts used in the potash salts, and is less in the soda salts, as the weights of both salt and water are increased.

On mixing two of these salts together and performing another series of experiments, with a weight of water equal to the joint weight of the salts, the following results were obtained:

Sulphate of soda and nitrate of ammonia reduced the temperature				47°	Fahr.
Chloride of ammonium	"	"	"	40°	"
Chloride of potassium	"	"	"	36°	"
Nitrate of potassa and chloride of ammonium			"	36°	"
Sulphate of soda	"	"	"	34°	"
Nitrate of soda	"	"	"	30°	"
Chloride of potassium and nitrate of soda			"	20°	"
Sulphate of soda	"	"	"	18°	"
Nitrate of potassa and chloride of sodium			"	18°	"
Nitrate of ammonia and nitrate of potassa			"	40°	"

A few experiments were likewise tried with a mixture of three salts, the latter being in equal amount, and, together, equal to the weight of the water they were dissolved in. Under the the most favorable circumstances, i. e. when the amounts used were largest, the results were as follows:

Sulphate soda, nitrate of ammonia and nitrate potassa, the temperature sank	47°	Fahr.
Chloride ammonium, sulphate soda, and nitrate potassa	41°	"
Nitrate potassa, nitrate soda, and nitrate ammonia	48°	"

Condensed from Wittstein's Viertiljh. f. prak. Pharm. Bd. xiii. p. 3.

Rendering Castor Oil tasteless.—It is stated by Stan. Martin that the disagreeable taste of this oil may be concealed, by beating it well up with the contents of an egg, and adding a little salt, or sugar, and a few drops of orange flower water.

Pencils of Sulphate of Copper.—These may readily be formed, according to K. Calmberg, by triturating briskly together four parts sulphate of copper, and one part borax. The water of crystallization given out unites the two into a plastic mass, which may be moulded as desired.

On the adulteration of spices.—Dr. H. Schröeder states that microscopical examination affords the best test for the adulteration of spices. It is necessary, however, in the first place to become acquainted with the appearance not only of the genuine articles, but also of the substances used in sophistication. Dr. S., has examined a number of samples of commercial spices, with the following results:

Black Pepper.—Of 42 specimens, 10 only were found to be entirely pure. Rape seed oil cake, burnt and ground acorns, dried and ground bread crusts made up a large part of the remainder. Under a power of 60 diameters, the thin brown seed coats of the rape seed were plainly seen: by a power of 200 diameters, the starch grains of the acorns and bread crusts were readily recognized by their size and shape.

Ground Cloves.—6 samples, out of 40 examined, were found to be unadulterated. Clove stems, sandal wood, brick-dust, pimento, ground acorns, bread crusts, oil cake, and cloves deprived of their oil, were found to be largely mixed with the cloves. 3 specimens contained no cloves at all, but owed their smell to a few drops of the oil. 10 specimens were mixed with some fixed oil, in order to give to a worthless powder an oily appearance. This adulteration may be readily detected by the permanent stain which such a mixture gives to paper on which it is rubbed. Clove stems and cloves, when triturated with iodine and iodide of potassium in solution, show under the microscope no starch grains at all—or at most—but a few scattered ones; on the other hand, in ground acorns and bread crusts they are readily seen. In pimento, they are enclosed for the most part in the cellular tissue. Under 200 diameters, the clove stems display a multitude of elongated cells, and spiral vessels; pure cloves contain neither these elonglated cells, nor spiral vessels. Brick-dust and sandal wood under a power of 60 diameters may be directly observed.

Ground Pimento.—Of 35 samples, 12 were pronounced pure. The foreign material in the others, appeared to be clove stems, sandal wood, other colored woods, oil cake, and perhaps chicory coffee.

Ground Cinnamon.—This spice seems to be adulterated with many kinds of wood; mahogany and cedar wood have been recognized in the commercial article, though the substitution of inferior kinds, in the place of the finer varieties of this bark appears to be the most common method of sophistication. 15 samples out of 42 examined, proved to be genuine Chinese cinnamon.

Ground Ginger.—9 samples out of 32 examined, were composed of pure bleached ginger. 13 specimens contained the flour of peas, lentils or beans. 2 lots consisted entirely of turmeric. By the aid of polarized light and a magnifying power of 200 to 500 diameters, the starch grains of the peas, lentils and beans were readily distinguished from those of the ginger. By a power of 200 diameters the yellow colored cells of the turmeric may plainly be recognized.—Polyt. Centrallehalle, Vierteljh. Ph. Bd. xiii. p. 85.

GLEANINGS FROM GERMAN JOURNALS.

By John M. Maisch.

Nitrates in Marsh's Apparatus.—Dr. Rieckher found that metallic bismuth is separated in the apparatus if nitrate of bismuth, zinc and chlorhydric acid react upon each other, and that scarcely any hydrogen is evolved which reduces the oxide of bismuth and the nitric acid; the latter is found in the contents of the flask as ammonia. The author believes this to be a good method for the direct estimation of nitric acid in nitrates, nitrous ether, &c.—(N. Jahrb. 1863, July 3.)

Carbonate of Potassa, nearly pure, is prepared by O. Wirsching by deflagration of a mixture of two parts pure nitrate of potassa and one of charcoal. Hager recommended some years ago to purify charcoal by washing it with dilute muriatic acid and then use one part of it to 3 of pure saltpetre.—(Neues Jahrb. f. Ph. xx. 17.)

Analysis of Canary Seed.—Jos. Hanamann found in the dry seed of Phalaris canariensis fat 5·30, resin and extractive 5·42, dextrin and sugar 2·44, starch 54·45, protein compounds 18·75, cellulose 9·65, mineral constituents 5·19 and traces of citric and oxalic acids. The air dry seeds contained 11·5 per cent. moisture. The ashes yielded 61·63 silicic acid, 24·304 phosphoric acid, traces of sulphuric acid and chlorine, 4·793 potassa, 3·043 soda, 3·749 magnesia, 1·459 lime, ·144 alumina, ·273 ferric oxide and a trace of manganium.—(Wittst. Viert. Schr. 1864, 517—522.)

Persian Insect Powder.—Heller and Kletzinsky stated in 1856, that the floral heads of Pyrethrum carneum, (roseum caucasicum,) which had been collected on Caucasus, contained a volatile oil and santonin as active principles, but no narcotic poison or alkaloid. Jos. Hanamann, corroborates this statement except for santonin which he could not detect; the volatile oil, separated from the distillate by means of ether, is of a pale yellow color, faint aromatic taste, but strong penetrating odor resembling fresh chamomile flowers, it stupefies and kills insects.—(Ibid. 522—525.)

Solubility of Alumina in Ammonia.—Jos. Hanamann has observed that 18752 parts of ammoniawater of 3·93 per cent. dissolves one part of alumina recently precipitated, but that the presence of chloride of ammonium decreases this solubility materially.—(Ibid. 527.)

The berries of Viburnum Lantana, have been subjected to a proximate analysis by J. B. Enz, who obtained tannin coloring ferric salts dark green, valerianic, acetic and tartaric acids, yellow amorphous and hygroscopic bitter principle, acrid principle, red coloring matter, sugar, gum, fixed oil, wax, and chlorophyll.—(Ibid. 528—535.)

Thallium.—The so-called "ice-salt" from Nauheim, Hessia, is a mixture of salts, obtained during the winter from the residuary motherliquor of table salt, and is frequently employed by confectioners for refrigerating mixtures. Professor R. Boettger's analysis proves it to consist chiefly of the chlorides of potassium and magnesium, intermixed with some chloride of sodium, also with thallium, cæsium and rubidium in the form of

chlorides; it is the cheapest material for the preparation of compounds of the last two metals. The oxide of thallium is readily soluble and caustic, its carbonate soluble and of an alkaline reaction, its double salt with bichloride of platinum sparingly soluble in water; the thallium-alum crystallizes in octohedrons; all these facts, as well as its being a frequent companion of potassium, sodium, rubidium and cæsium give it a place among the alkaline metals.—(Ibid. 535—536.)

The leaves of Zostera marina, Najadeæ, known in commerce under the name of seagrass, yield according to E. Baudrimont, after drying at 212 of, 23·28 per cent. ashes, consisting of 24·20 silicic acid, 20·45 free lime, 20·41 chloride of sodium, 9·54 phosphate, 5·38 carbonate, 2·07 sulphate of lime, 4·21 chloride and 0·83 iodide of potassium, 3·81 sulphate of potassa, 1·79 ferric oxide, 1·54 magnesia, ·26 alumina, and traces of bromide, sulphides and cyanides, the balance was charcoal and loss.—(Ibid. 543, from Journ. de Ph. et de Chim. xlii. 388.)

Cauterizing sticks of sulphate of copper, may be formed, according to A. Calmberg of Darmstadt, by triturating 4 parts of this salt with one part of borax. By the water of crystallization the mixture forms a paste which can be rolled out to sticks of any desired length. If it should become too dry, the addition of a few drops of water will reproduce the requisite consistence.—(Ibid. 543.)

The volatile oil of German Chamomile flowers, Matricaria chamomila, has again been examined by G. Bizio, (Berichte d. Wien. Acad. xliii. 292.) It is of a beautiful blue color, congeals at —20° C. (—4 F.), turns green with diluted muriatic and nitric acid, reddish-yellow with concentrated sulphuric acid, yellowish white and tough with chlorine, red-brown and thick with iodine, and brown and elastic with bromine. The boiling point rises from 240 to 300° C., at which temperature it decomposes leaving a resinous residue. It is little altered by fusing potassa, distilled with anhydrous phosphoric acid, a nearly colorless oil is obtained having the odor of petroleum, and the composition C_{20} H_{16}; the composition of the original oil is $5C_{20}$ H_{16} + 6 HO.—(Ibid. 550.)

The hydrates of chromic oxide have been again examined by

Siewert (Zeitschr. f. d. ges. Naturwiss. xviii.) The light blue precipitate obtained hot or cold from a dilute solution of chromic oxide by ammonia, is after drying $Cr_2 O_3 + 7$ aq.; dried in vacuo it retains 4 aq., and after heating to 200 or 220°C., with the entire exclusion of oxygen, it is $Cr_2 O_3 +$ aq., of a bluer color, with a tint of grey, and insoluble in boiling dilute muriatic acid. Heated to the same temperature in contact with the air, a black powder is obtained, being a mixture of several compounds and of variable composition. The pure hydrate is insoluble in ammonia; a compound of the two, however, may enter into combination with a salt of ammonia, and is then soluble in ammonia water. Fremy's so-called metachromic oxide still contains ammonia and ammoniacal salt. A green modification of chromic oxide does not exist; the precipitate retains soda or potassa.—(Ibid. 553).

Crystals in Vegetable Tissues.—Dr. Flückiger (Schweiz. Wochenschr. f. Ph. 1862. Nos. 8 and 9) agrees with Kindt, that the crystals in quillay bark are oxalate of lime; the bark contains also some tartrate of lime. The crystals in guaiac bark are likewise oxalate of lime. Tamarinds are free from oxalic acid, but contain some starch; the crystals which are met with, consist of tartrate of lime.—(Ibid. 569).

Castor oil may be given, according to Stan. Martin, with eggs to persons who cannot take it in the usual forms. The necessary quantity of the oil is mixed in a flat pan with one or two eggs, and then heated with constant stirring. The Chinese use castor oil in the preparation of their victuals; it has no purgative action on them, they having become accustomed to its use from childhood.—(Ibid 572).

The reduction of salicylous acid to saligenin may be effected, according to A. Reineke and Beilstein, by treating the acid with a little water and sodium amalgam. After several days, hydrogen commenced to be evolved and the salicylous acid had disappeared from the alkaline liquid. It was neutralized with sulphuric acid, carefully evaporated, and the residue treated with alcohol, which, on evaporation, left saligenin, recognized as such, by its reactions and by ultimate analysis. The following equation shows its formation: $C_{14} H_6 O_4 + H_2 = C_{14} H O_4$. If salige-

nin is regarded as the alcohol of salicylic acid, the above reaction agrees with the well known cases of reduction of the aldehydes.—(Ann. d. Chem. und Ph. 1863, No. 179).

Decompositian of chloride of ammonium by boiling.— R. Fittig has instituted a series of experiments, taking all due precautions with regard to the purity of the materials and apparatus, and comes to the conclusion that at the boiling point, a solution of chloride of ammonium becomes acid by the decomposition of this salt and the elimination of ammonia, and that the amount of ammonia evolved decreases with the duration of the experiment, most probably in consequence of the contiguous evaporation of some muriatic acid, which combines again over the surface of the liquid with an equivalent portion of ammonia, so that the distillate is free from chloride.—(Ibid. 189—193).

Preparation of Bromides.—Liebig's well known method of preparing iodides with the aid of phosphorus (see Am. Jour. Ph., p. 289 and 437), has been employed by Dr. F. Klein for bromides with favorable success.—(Ibid. 237—240).

Expressed oil of Nutmegs. A. Ricker obtained from four pounds of nutmegs, by two expressions between heated plates, sixteen and a half ounces of oil, the residue yielded now only half a drachm of volatile oil, and very little fat. The expressed oil is pale-yellow, not yellowish red like the commercial article, possesses a much stronger odor, less fatty to the touch, with greater difficulty absorbed by paper, and solidifies much quicker after fusion, forming warty excrescenses upon the surface. The specific gravity of the former is ·998, of the latter, ·995; the fusing point is 45° C., while the commercial oil liquifies at 41.25°; the saturated solution of the former in boiling ether solidifies to a solid crust, while the solution of the latter remains soft on cooling; the former solution mixed with absolute alcohol and spontaneously evaporated, left microscopic crystals of the form of a cross; the latter did not crystallize. The author believes that the commercial oil is either mixed with another fat, or else nutmegs, previously deprived of the volatile oil, are used in its preparation. He recommends its preparation by the apothecary, not only because a pure, better, and more active product is

gained, but likewise on account of economy, the saving being at that time 14 per cent.—(N. Jahrb. d. Pharm. xix. 19).

Test for Atropia.—Gulielmo states that a little atropia dissolved in a few drops of concentrated sulphuric acid, and heated, acquires a brown color, emitting at the same time an intense odor, resembling the flowers of oranges and Prunus spinosa. The odor is particularly evident, if a few drops of distilled water are added, as soon as the brown color and vapors appear.—(Kühtze's Notizen, 1863, Oct. from Schweiz. Wochenschr).

Honey.—C. Kraut induced Dr. Kemper to feed bees with commercial grape-sugar, and he obtained a hard yellowish white honey, less sweet than ordinary honey, which Roeders found to contain nothing but dextrogrape sugar. Wild honey (Heidhonig) contained only invert sugar, that is dextrograpе—and lævo-fruit sugar in equal equivalents. Cuba honey was invert sugar with some dextrogrape sugar in excess. All three were free from cane sugar. It appears, therefore, that the bees are incapable of altering the nature of the sugar, which they convert into honey, unless indeed cane sugar should be split into dextrogrape, and lævo-fruit sugar.—(Ibid. from Zeitschr. f. Chem. und Ph. 1863, 359).

An excellent refrigerating mixture, reducing the temperature to −30°R. (−35.5°F) is obtained according to Reissig, by mixing sulphocyanide of potassium with ice. The salt is reobtained by evaporation.—(Ibid. from Polytechn. Centralhalle).

Solid hydruret of Arsenic.—Dr. Wiederhold obtains this compound, discovered by Davy, by dissolving a compound of five equivalents of zinc and one of arsenic in diluted muriatic acid, when it remains behind in a pure state, retaining only a little charcoal from the metallic arsenic. It is a light voluminous powder of a red-brown color, resembling binoxide of lead, yellowish when finely divided, turning dark-brown in the direct sunlight, insoluble in all simple solvents, decomposed at 200° C. Ignited in the air, it burns like spunk with a yellow color; the residue contains metallic arsenic, arsenious acid, and a little of a black body, containing some, very probably, unknown oxide of arsenic. It burns in fuming nitric acid to arsenious and arsenic acids; cold nitric acid of 1.20 sp. gr. dissolves it, form-

ing the same acids. Other diluted acids are without action. The average of three analyses gave 0.484 per cent. hydrogen.—(Poggend. Annalen, 1863, May, 615).

GLEANINGS FROM THE FRENCH JOURNALS.

By the Editor.

On Tincture of Mustard.—It is well known that a solution of volatile oil of mustard in alcohol is a good rubefacient. This may be procured, more economically, according to M. Barbet, by macerating, during two hours, 250 parts of black mustard flour in 500 parts of cold water, and adding afterwards, 125 parts of alcohol of 86°C., and distil 125 parts of distillate, which will be found to possess a decided rubefacient action.—*Jour. de Pharm. de Bordeaux.*

Jelly of Codliver Oil.—M. Dufourmantle proposes the following recipe for preparing a jelly of this disagreeable medicine. Take of codliver oil, 30 grammes, isinglass, 2 grammes, water, a sufficient quantity to dissolve the isinglass. When the latter is dissolved, add the oil gradually, stirring constantly, aromatizing it at the same time with anise or other oil, four drops. A large table spoonful of this jelly is a dose.—*Jour. de Pharm.*, Janv., 1864.

Anti-asthmatic paper.—Take of leaves of Belladonna, stramonium, digitalis and sage, each five grammes, tincture of Benzoin, forty grammes, nitrate of potassa, seventy-five grammes, water, one thousand grammes. Make a decoction or infusion with the plants, and water, dissolve in this the nitrate of potassa, add the tincture of Benzoin, and mix them. Into this plunge the paper, which, should be unsized and spongy, like filtering paper, sheet by sheet, until a quire is introduced, which, after twenty-four hours' contact, removed, dried, and cut into squares four inches long and two and three-fourths wide, which should be enclosed in boxes, each containing one hundred leaves. Of course it is understood that this paper is to be used by burning it so as to charge the asmosphere breathed by an asthmatic patient with the products of its combustion and volatilization. This paper is sometimes

made into tubes by rolling upon a mandril and fixing the edge with paste.—*Bull. de la Société de Pharm. de Bordeaux.*

On the Preparation of Rose water.—M. Monthus states that the petals of the hundred-leaved rose are more odorous as the centre of the flower is approached, and that it might be inferred from this that the rejection of the calyx and exterior petals would improve the product distilled from the remainder. On the contrary, M. Monthus finds that the presence of this organ not only does not injure the quality of the product, but insures its preservation. When thus prepared, rose water is less subject to be filled by mucilaginous matter, which is the source of the alteration of this liquid.

M. Monthus attributes this effect to the astringent principle contained in the calyx which has a coagulating influence on the matter, which prevents it from being carried over in distillation.—*Rep. de Pharm.*

Coriamyrtin.—This is the active principle of Coriaria myrtifolia, as, according to M. J. Ribau, it produces in doses of 0·2 gr., given to a dog, vomiting and horrible convulsions, followed by death in less than two hours. The same effects are caused by subcutaneous injection. The principal phenomena produced by Coriamyrtin, are violent agitation of the head, communicating with all the members, clonic and tetanic convulsions, contraction of the pupil, trismus, and frothing at the mouth. After death the large vessels are found gorged with brown coagulated blood. Coriamyrtin does not irritate the mucous membrane of the intestines.—*Rep. de Pharm.*

ON BREAST PLASTERS.

By Edward Parrish.

There is a frequent demand in practice for suitable emollient, sedative and stimulant plasters, for treating the various stages of phlegmonous inflammation of the mammæ of females, and few prescriptions are more closely scrutinized, by patient and nurse, than those designed for the treatment of this very painful and weakening form of disease.

The old remedy, known as Logan's Plaster, which for many

years was almost overlooked, has recently assumed importance in this connection. It is made according to a formula published in my work on Pharmacy, third edition, page 778, by boiling together pure Castile soap, oxide and carbonate of lead, olive oil and butter (without salt) till the proper consistence of a plaster is attained, and then adding a little powdered mastich. Though similar to the simple Diachylon or lead plaster, this is of a more emollient character, free from the tendency to become dry and brittle upon the surface and by its consistence adapted, to be spread and applied without the application of more than a very moderate heat—Logan's Plaster is, moreover, not liable to adhere so tightly as to cause pain in removing it.

In Dr. Dewees' Breast Plaster this is one of the ingredients; a modified formula for this now nearly obsolete remedy is as follows:—

Dewees' Breast Plaster.

Take of Lead plaster, three ounces;
Ammoniac plaster, half an ounce;
Logan's plaster, one and a half ounces;
Spermaceti, } of each two drachms.
Camphor, }

Melt the plasters together, then add the spermaceti and camphor and remove from the fire.

The application of ointments and cerates to the breast as substitutes for plasters is rather objectionable, from the fact that the tissue or skin upon which they are spread so rapidly absorbs the unctuous ingredients, yet Deshler's salve, Ceratum Resinæ Compositum of the Pharmacopœia, is one of the most popular of stimulating applications and is especially recommended by nurses, who acquire considerable familiarity with the treatment of these troubles.

A very favorite stimulating and anodyne application for this purpose is made by the following formula, furnished me by Wm. J. Allinson, of Burlington, N. J., and was formerly much prescribed by my brother, Dr. Joseph Parrish:—

Improved Tobacco Ointment.

Take of Tobacco leaves, five ounces;
Vinegar, a quart.

Digest the leaves in the vinegar till evaporated to half a pint;

strain and express the liquid, then evaporate by moderate heat to about three fluidounces; triturate this with—

Extract of Belladonna, one ounce.

Then take of—

Camphor, in powder, six drachms and a half;
Resin cerate, six ounces and a half.

Mix these by fusion at a moderate heat and incorporate them with the mixed extracts of tobacco and belladonna.*

The following formula is that formerly much in use by Prof. SAMUEL JACKSON, under the name of

Dissolving Salve for Breasts.

Take of—

Extract of belladonna, } of each half a drachm;
Extract of conium, }
Tannin, one drachm;
Soap, } of each three drachms.
Simple cerate, }

Mix together the cerate and tannin; dissolve the soap in a little water, by a gentle heat, add to this the extract previously rubbed down with a little water; then mix rapidly on a warm slab the two parts together.

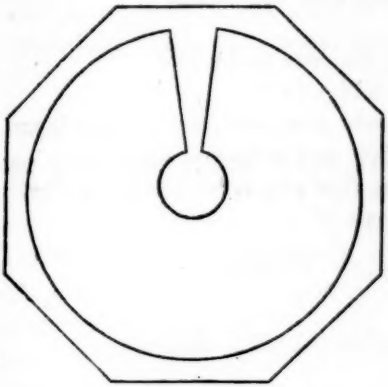
Of the applications I have had occasion to dispense during several years past, that prescribed by Dr. ELLWOOD WILSON, consisting of equal parts of Logan's plaster and the officinal Belladonna plaster, seems the best adapted to rank as a standard remedy in mammary abscess, and I have made it the basis of a plaster which I have supplied to physicians for the requirements of country practice.

The proper shape of mammary abscess plasters for general use is a subject requiring some thought, and I have, I think, made an improvement, in explaining which the accompanying cut, from the new edition of my work, will aid. Such plasters are usually made round, varying from seven to eight and a half inches in diameter, with a hole in the middle for the nipple, they then require to be incised at least half way in from the outer edge, so as by lapping the edges to accommodate it to the convex shape of the breast, a method which causes such inequalities

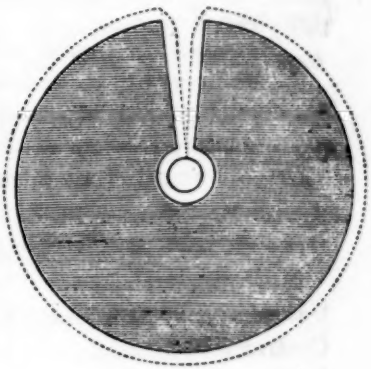
* [See Amer. Journ. Pharm. vol. xxii. page 21.]

as to interfere somewhat with the emollient effect of the plaster.

No. 1.



No. 2.



Of the two figures, No. 1 represents a pattern which may be cut out of stiff glazed paper or preferably made of tinned iron; No. 2, a breast plaster as spread by the use of the pattern. The diameter of the plaster is seven inches, the margin one inch; the orifice for the nipple is placed rather nearer one side than the other, so as to apply the larger portion on the under, swagging portion of the mamma; the strip remaining unspread is designed to be cut open on the dotted lines, No. 2; by opening or closing or overlapping the edges, on applying it the plaster may be made smaller or larger at pleasure, and may be adapted to the convex shape of the breast without nicking it all around as is usually done.

In regard to the material for spreading these plasters upon, I should decidedly prefer chamois skin over any other prepared skin; its softness and flexibility render it greatly preferable to glazed sheep skin. For cerates, thick and highly glazed muslin will serve a good purpose, but it may be required to be nicked to adapt the plaster to the convexity of the mamma. In using a paper pattern to adjust the shape of the plaster it should have a good deal of paste spread on its under surface so as to continue moist till the operation is completed; a paste of gum Arabic will dry too quickly; plaster may be melted in a ladle and poured upon the skin and spread by the aid of a moderate-

ly warm spatula; if melted till very fluid the plaster will "strike through" the skin, which will become brittle; if not melted enough it may be too thick and uneven; in no case should it smoke or give off much odor in being melted and spread, this being a sure indication of its deterioration.—*Med. and Surg. Reporter, Feb.* 6, 1864.

ON A NEW KIND OF MATICO, WITH SOME REMARKS ON OFFICINAL MATICO.

By Professor Bentley, M.R.C.S. Eng., F.L.S., etc.
Professor of Materia Medica and Botany to the Pharmaceutical Society of Great Britain, etc.

History.—Under the name of *matico, matecô, or matica,* the leaves of several plants are employed by the inhabitants of Central and South America, for arresting both external and internal hæmorrhages, and for other purposes. A nearly similar story is told throughout America, as to the discovery of the styptic property of each kind of matico. It is said, that a Spanish soldier named Matico, when desperately wounded, dragged himself into the shade of the plants near him, and in his agony plucked some of their leaves, and applied them accidentally to his wound, when, to his great surprise and delight, he found in a short time that the bleeding was arrested, and the wound soon healed. From this circumstance Matico has received the Spanish names of "Yerba soldado," and "Palo del soldado," signifying "Soldiers' herb," and "Soldiers' tree." Three plants have been especially mentioned by authors as having received the name of Matico, or Soldier's herb, namely, *Artanthe elongata,* Miq.; *Eupatorium glutinosum,* Kunth;* and *Walteria glomerata,* Presl.† The latter has not as yet been noticed in Materia Medica works, and I have seen no specimens of it; indeed, was unacquainted with it until my attention was recently directed to this kind by Dr. Seemann. Specimens of the two other varieties of matico may be seen in the museum of the Pharmaceutical Society, and are now on the table. The first, namely, that which consists of the leaves of

* Lindley's 'Medical and Economic Botany,' p. 227.
† Seeman's 'Botany of the Voyage of H. M. S. Herald,' p. 85.

Artanthe elongata, Miq., is the only one that has received any special attention, or the action of which has been tested, beyond its native country. This kind of matico is a native of Peru, where it is very highly extolled as a vulnerary, and for its aphrodisiac and other properties.* It was introduced to the notice of the medical profession in England, as far back as 1839, by Dr. Thomas Jeffreys, of Liverpool,† and it is noticed in a paper by Mr. Morson, entitled "Observations on certain Plants of the genus Piper," which was published, and the plant well figured, in the third volume of the 'Pharmaceutical Journal.'‡ It was subsequently introduced into the Dublin Pharmacopœia in 1850, and formulæ therein given for the preparation of "Tincture" and "infusion of matico." In England it has not been generally much esteemed as a medicinal agent for internal administration, and its action even when locally employed to arrest bleeding, has been regarded by some writers of eminence, as simply mechanical,—the peculiar structure of the leaves of which it is composed, being supposed to divide the blood, and thus promote its coagulation.§ The committee appointed by the Medical Council to frame the forthcoming "British Pharmacopœia" have, however, and as I think properly so, thought matico of sufficient importance to be introduced into the list of Materia Medica to be published in that volume, and have also given a formula for the preparation of "Tincture of Matico." In the States of North America, matico has been much employed of late years, and highly extolled for its power of arresting internal hæmorrhage;‖ and has been introduced into the Primary List of the Materia Medica of the new United States Pharmacopœia, which has been just issued. The fact of matico having thus been, or about to be, introduced into the new United States and British Pharmacopœias, makes everything relating to it of especial importance

* 'Pharmaceutical Journal,' vol. ii. p. 660.

† 'Lancet,' Jan. 5, 1839, p. 567.

‡ 'Pharmaceutical Journal, vol. iii. pp. 472 and 525.

§ Pereira's 'Materia Medica and Therapeutics,' 4th edit. vol. ii. part 1 p. 397, and Wood & Bache's 'United States Dispensatory,' 11th ed. p. 494

‖ Carson's American Edition of Pereira's 'Materia Medica.'

at the present time, and hence, I have thought it a desirable subject to be introduced to the notice of this meeting.

From the great demand for matico which has recently arisen, in consequence principally of its extensive use in the States of North America, through the war which is now unfortunately desolating that enormous tract of country, it has become scarce and of high price; and indeed, at the present time, true matico—that which is to be officinal in the new British Pharmacopœia—is scarcely to be obtained in any quantity in this country. This scarcity of true matico, and the impossibility of immediately supplying the demand, has probably led to the recent large importation of the leaves of another plant under the same name; and the object of this paper is, more especially, to direct attention to, and to describe that substance.

My attention was at first called to this matico about six weeks since, in consequence of receiving from a well-known herbalist, in extensive business in London, a sample of a drug which had been recently imported, and which consisted of dried broken leaves, some small pieces of branches and a few spikes of flowers. I was requested to inform him as to its nature, and the name of the plant which yielded it. Upon examination, I saw directly, from the odor and botanical characteristics of the drug that it had been derived from a plant of the Order PIPERACEÆ, and most probably from a species of the same genus as that yielding the officinal *matico*. Further examination clearly exhibited that my first conjecture was correct, and that it had been obtained from a species of *Artanthe*. Upon further inquiry I found that some genuine matico, and some of the present drug also under the name of matico, had recently arrived in the 'St. Thomas,' from Colon, a port situated at the terminus of the Panama railroad, on the Atlantic side. The drug had been consigned to a merchant in this city, and was afterwards offered for sale as matico, by a highly respectable firm of brokers. The respectability of all the parties concerned in this country, and elsewhere, who had knowledge of the transaction, and the public manner in which the drug had been offered for sale, showed that no fraud was intended, but that it was supposed to be, either true matico, or

a substance allied to, and analogous in its properties to that drug, and probably known in the district from whence it had been forwarded under the same name.

Having now got a clue to the botanical and geographical source of the new drug, I went to the British Museum, where every opportunity was kindly afforded me by Mr. Carruthers of consulting the necessary books upon, and the dried specimens of, the different species of Artanthe which were preserved in the Museum collections. As there are nearly two hundred species of this genus, natives of the West Indies, and of Central and South America, described by Miquel, the standard authority of the order *Piperaceæ*;* and from the fact of my only having some broken leaves, and a few small pieces of the branches and flower-spikes, for examination and identification, the task, as may be supposed, was by no means an easy one. At first, I thought from its having arrived with some genuine matico, and also from the resemblance it bore to a specimen in the Museum collection, marked *Artanthe elongata*, Miq., which was stated to be derived from South America, and obtained from Pavon's Herbarium, that it might be like true matico, also obtained from *Artanthe elongata*. Its marked difference from ordinary commercial matico, however, and a more minute examination, were opposed to this supposition. I then carefully compared my specimen with the other dried specimens of *Artanthe* in the Museum, and after a minute critical examination and comparison with them, I came to the conclusion that it corresponded most nearly with that marked *Artanthe adunca*, Miq. Further examination of Miquel's 'Systema Piperacearum,' as well as the works of Jacquin, Ruiz et Pavon, and of other authors which refer to the botanical characters and geographical sources of *Artanthe adunca*, have satisfied me, so far as it is possible for me to be so, from the examination of the imperfect specimens in my possession, that this new kind of matico is derived either from one of Miquel's varieties of *Artanthe adunca*, or from a species very nearly allied to it, and which can only be determined satisfactorily by the examination of more perfect specimens than

* Miquel's 'Systema Piperacearum.'

those in my possession. I believe, however, that the species yielding it will turn out to be *Artanthe adunca*.

Since my examination of the above sample, I have had an opportunity of inspecting other samples at the same broker's from which it had been obtained, and I found that all of them consisted essentially of the leaves of the same plant as that just mentioned, but in some there was a little genuine matico, and the leaves, etc., of apparently some other species besides those already alluded to, mixed with them in varying proportions. The following are the synonyms, botanical characters, and geographical sources of *Artanthe adunca*, Miq.:—

SYNONYMS.—*Artanthe odunca*, Miq.; is the *Piper aduncum*, Linn.; *Piper arborescens*, Mil. Dict.; *P. scabrum*, Lam. Ill.; *P. lanceolatum*, Salzmann; *Steffensia adunca*, Kunth; and the *Piper longum, folio nervoso pallide viridi humilius*, of Sloane. The first name is that now generally employed by botanists. In common language it is known under the names of Hooked-spiked Pepper, and Spanish Elder.

Etymology.—The generic name of *Piper* appears to have been derived from *pippul*, the Bengalese name of the Long Pepper, although some authors ascribe it to πεπτω, πεπτφι, to digest; that of *Artanthe* is from αρτυμα, seasoning, spice, and ανθος, a flower. The specific name *aduncum*, refers to its curved or hooked spike of flowers. The origin of the common name of Hooked-spiked Pepper is at once manifest; that of Spanish Elder, by which it is known in Jamaica, is derived from its protuberant jointed stems somewhat resembling those of the common Elder.

BOTANY.—The genus *Artanthe* is now universally placed in the Natural Order *Piperaceæ*.

Generic Character.—*Spikes* solitary, opposite the leaves. *Flowers* hermaphrodite. *Style* none. *Bracts* peltate or cucullate.*

Specific Character.—The following description is taken from Miquel:—†

* Miquel's 'Systema Piperacearum;' and Lindley's 'Medical and Economic Botany,' page 133.

† Miquel's 'Systema Piperacearum,' page 449. Figures of the plant may be seen in Sloane's 'Natural History of Jamaica,' vol. i. p. 135, tab. 87, fig. 2; and Jacquins 'Icones Plantarum Rariores,' vol. ii. tab. 210.

"Ramis ramulisque striatis aspero-verruculoso-punctulatis, junioribus appresse hispidulis, foliis breviter petiolatis, regido-membranaceis pellucido-punctulatis, supra opacis scabriusculis, subtus pallidis puberulis, lato-oblongis vel (summa) sublanceolato-oblongis, plus minus inæquilateris, acuminatis, basi leviter inæquali rotundatis, lineatomulti-(6-7)-costatis, amentis erectiusculis folio brevioribus, falcatim curvatis, pedunculo petiorum quater vel quinquies superante, bracteis peltatis, ciliato-fimbriatis, baccis obovato-tetragonis, vertice subrotundatis, semine conformi leviter areolato."

Miquel also enumerates the following four varieties:—*Forma foliis omnibus lanceolato-oblongis*, from Jamaica; *Forma foliis angustioribus*, from French Guiana; *Forma caule ramisque glabris*, from Porto Rico, etc.; and *Forma foliis rugosioribus et magis scabris*, from Brazil and Bahia. Hence it is evident that the species varies much according to its geographical source, which renders it more probable that, although the new matico differs in some minor details from Miquel's description as given above, as it agrees in the main with it, we are correct in referring it to *Artanthe adunca*, Miq.

Habitat.—*Artanthe adunca* has a wide geographical distribution throughout the tropical regions of America. It has been found in Jamaica, Barbadoes, San Domingo, Porto Rico, the Caraccas, Surinam, Bahia, Valencia, Guiana, and the Brazils. Its wide geographical distribution is an additional argument in favor of the present kind of matico being derived from it.

General Characteristics.—As imported, this new kind of matico consists chiefly of dried, more or less broken, loosely aggregated or somewhat compressed fibrous leaves; together with a very few flower-spikes; and small fragments of branches. It has a greenish color; a strong, agreeably aromatic, and somewhat pungent odor, in some respects resembling that of true matico; and an aromatic, somewhat spicy, pungent taste.

More minutely examined, the *leaves*, (of which some may be found nearly entire) are then seen to be four, five, or more inches in length, and from one and a half to two and a half inches in breadth. They are oblong, oblong-lanceolate, or oblong-ovate in form, entire at the margins, acuminate-pointed, and somewhat unequal, and more or less rounded at the base. They have short petioles, which are channelled above, rounded beneath, and enlarged at the base, or part by

which they were originally attached to the stem, and are commonly somewhat rough, or more or less hairy or pubescent. They have a somewhat membranous texture. Their upper surface is dark-green, opaque, and commonly more or less rough, although in some specimens they are nearly smooth; they are without hairs, and have from four to six somewhat sunken veins, arising alternately on each side of the midrib, and passing upwards parallel to, and approaching each other above, and ultimately terminating at the margins. Towards the base are several other smaller veins, which pass at once to the margins of the leaf. The under surface is pale-green, with prominent light-colored veins, which in number and direction correspond to the veins above; these divide more or less, and give a corresponding, more or less reticulated character to the surface. There are commonly no hairs between the ramifications of the veins (although in some leaves these may be found); but the veins themselves are usually more or less pubescent, and in some cases very evidently so.

The *stalks* are striated, more or less compressed, somewhat rough from the presence of minute tuberosities on the surface, and are furnished at intervals with prominent nodes.

The *flower-spikes* are slender, of a cylindrical shape, yellowish or brownish in color, closely covered with minute flowers, more or less hooked, curved, or twisted, and three or more inches in length.

It will be seen from the above characteristics, that the new kind of matico may be at once distinguished from the officinal and old kind of matico, by the leaves, etc., being in a less compressed state than in it; by their more fibrous nature, which makes them more difficult to reduce to powder; by their upper surface not being so tessellated or rough; and, generally, by the almost entire absence on the under surface of pubescence, and in all cases, far less pubescent character. Hence the tessellated upper surface, and very pubescent character of the lower surface of the leaves constituting true matico, are at once sufficient to distinguish them from the leaves of the new kind of matico.—*Lond. Pharm. Journ.*, Jan., 1864.

ON THE USES OF HYPOSULPHITE OF SODA.

By W. A. Froehde.

The author has found this salt to be a very delicate test for cyanides. In all cases sulphocyanide, sulphuret and sulphate are formed. With cyanide of potassium the reaction is as follows: $2KCy+4(NaO,S_2O_2)=2\,NaCyS_2+2(KO,SO_3)+NaO,SO_3+NaS$. The following shows the decomposition of ferrocyanide of potassium: $2K_2FeCy_3 + 12(NaO,S_2O_2) = 6NaCyS_2 + 4(KO,SO_3) + 5(NaO,SO_3) + NaS + 2FeS$. With an insufficient quantity of the soda salt, cyanate is formed which is decomposed by the heat, carbonic acid being evolved and ammonia found in the residue. With ferridcyanide of potassium, after the previous desiccation of the salts, the result is similar, some sulphurous acid being evolved; otherwise sulphur and sulphurous acid are liberated, and sulphate and ferrocyanide formed according to the following equation: $K_3Fe_2Cy_6 + 2NaO,S_2O_2 = K_2FeCy_3 + Na_2FeCy_3 + KO,SO_3 + S_2 + SO_2$. Prussian blue and Turnbull's blue yield with the hyposulphite sulphuret of iron and sulphocyanide of sodium.

For detecting cyanogen in the solid cyanides, the operation is as follows: a little hyposulphite of soda is fused to a bead; after the desiccation of the salt, a minute quantity of suspected cyanide is added, and heat applied. If the bead of the platinum wire is now placed in a few drops of ferric chloride, an intense blood-red coloration will be produced around the wire, which gradually spreads over the whole liquid. If not heated long enough, some hyposulphurous acid may remain undecomposed and produce with the ferric chloride the well known violet color, which, however, disappears, the ferric salt being deoxidized to ferrous chloride. On the other hand, too long continued a heat will decompose and burn sulphocyanide with a peculiar red flashing flame. This process allows to distinguish cyanide of silver from chloride, bromide and iodide, or to detect it when mixed with the latter.

The above reaction furnishes a ready means for preparing sulphocyanides. One part of ferrocyanide of potassium is mixed with 3·5 parts crystallized hyposulphite of soda, the mixture desiccated and then heated to the complete decomposition of the hyposulphite; hot alcohol dissolves from the residue sulphocyanide of sodium.

Sulphocyanide of potassium is prepared in the same manner from one part desiccated ferrocyanide of potassium and 3 parts anhydrous hyposulphite of potassa.—*Poggend. Annal.* 1863, *Juli*, 317. *Chem. Centralbl.*, 1863, 698. J. M. M.

THE ABSORBENT POWER OF STARCH FOR THE COAL-TAR COLORS.

By W. J. Young.

By adding wheaten starch to a dilute, cold, aqueous solution of mauve, magenta, azuline, &c., the coloring matter is absorbed, and the supernatent liquor rendered nearly colorless, when left in contact for a few hours, with occasional agitation to ensure an equal absorption of the coloring matter by the starch.

In the case of azuline, a moderately strong solution was prepared, and treated with starch as above; every trace of blue was absorbed, and the supernatent liquor had a reddish tinge, due to the red coloring matter which generally accompanies solutions of azuline. When a more dilute solution of azuline was used, every trace of color was absorbed, and the liquor on filtration was clear and perfectly colorless.

The most of the coloring matter may be removed from the starch again by solution in alcohol.

By this process almost every variety of color may be procured —yellow, pink, various shades of red, blue, mauve, &c.—*Lond. Chem. News, Jan.* 23, 1863.

A VOLATILE ALKALOID IN DIGITALIS PURPUREA.

By treating the fresh leaves of foxglove in the same manner by which conia is extracted from hemlock, they yield a volatile alkaloid, which the discoverer, W. Englehardt (Zeitschrift für Chemie u. Pharm. 1862, December, p. 722) has named *Digitalium fluidum*, and which from the experiments made with it on animals appears to be the real bearer of the physiological action of this plant.

This alkaloid is exceedingly volatile, of an oily consistence, an alkaline reaction, difficultly soluble in water, readily so in alcohol, little soluble in chloroform, and soluble in absolute ether. Its odor is very penetrating, intermediate between that of conia and nicotina: when diluted it is not so unpleasant, (Neues Jahrb. f. Pharm. Januar, 1863. xix. p. 29.) F. F. M.

NOTE ON THE ROOT BARK OF CINCHONA CALISAYA.

By John Eliot Howard, F. L. S.

In almost every recent importation of the finest Calisaya bark from Bolivia, I have noticed an unprecedented amount of admixture of the *root bark*, which is easily distinguished by its peculiar characteristics, shown by the specimen I have sent to the Society. The *curly* shape in which it is found would strike the eye of every observer. It is imported in serons, along with the best quality, but often distinguished from these by an X branded on the hide. It will probably find its way into consumption for the manufacture of decoctions and tinctures, as it is not likely to be taken, except at an extremely low price by the manufacturers of sulphate of quinine. I have selected a very favorable specimen for examination, which yielded me in hydrated alkaloids of the first rough precipitation, 10 parts in 1,000, but from this very low percentage a still further deduction must be made, as the purified alkaloids gave only 8·14 parts in 1,000. Of this not more than 3·06 parts were obtained as a crystalline salt of quinine, and the remainder consisted almost entirely of the quinidine of Pasteur (crystallizing as a hydriodate). The substitution which thus appears to have taken place in the descent of the sap to the roots of quinidine for quinine demands further investigation, and if confirmed by other observations is not a little curious. According to Gerhardt the atomic constitution of quinine is $C_{40}H_{24}N_2O_4 + n$ aq., and of quinidine (of Pasteur), $C_{40}H_{24}N_2O_4 + 4$ aq. One would be ready to belive in the conversion of one alkaloid into another in this case, were it not that the remarkably different and contrasted mode in which they respectively act on the ray of polarized light seems to indicate some more remarkable difference in the real structure than is manifested by ultimate analysis. It is certainly in the leaves that the first formation of the alkaloids takes place in the plant, and as some of the other constituents accompany the alkaloids unchanged (for example, kinate of lime and kinovic acid) through the whole course of the downward descent of the sap, it becomes an interesting inquiry whence so great a change as the substitution of one alkaloid for another could arise. The mother substance which is found in the heartwood of *Cinchona succirubra*, (as I have described under that head) is split into

two or three substances in the bark, giving rise evidently to the cinchona red and also (as I think), under the influence of the *ammonia* which it is easy to detect in the external portions of the plant, to the formation of alkaloids. Patient investigation may hereafter lead to our ascertaining the mode of all these changes, which are at present sufficiently obscure.

In reference to the commercial value of the root bark of Calisaya, I have only to remark that the importers are greatly disappointed at the low estimation in which the article is held in Europe. The collectors in Bolivia had succeeded in passing this root-bark off as genuine Calisaya, which it (in one sense) undoubtedly is, and having hit upon the wasteful method of extirpating the finest species of Cinchona from the forests of Bolivia for the sake of a present profit, are now much annoyed to find that in "killing the goose which laid the golden egg" they have not even the consolation of selling the bird to advantage.—*Lond. Pharm. Jour. Feb.*, 1864.

ANTIDOTES FOR STRYCHNIA.

Professor R. Bellini, after conducting a long series of experiments on poisoning by strychnia and its salts, arrives at the opinion, that the best antidotes are tannic acid and tannin, chlorine and the tinctures of iodine and bromine. Chlorine, he maintains, attacks the strychnia even when it is diffused through the system, for he found that in rabbits poisoned with the sulphate of the alkaloid, on being made to inhale chlorine gas in quantity, such as was not sufficient in itself to kill, the convulsions were retarded, and were milder when they occurred; death also was less rapid. The author further observed, that when strychnia was exhibited with pyrogallic acid, the convulsion was retarded for the space of half an hour, by comparison with other experiments in which the alkaloid was given by itself. Professor Bellini believes that this arrest in symptoms is not dependent on the acid acting chemically on the strychnia, but only through the astringent effects produced by the acid on the mucous membrane of the stomach, whereby the absorption of the poison is rendered difficult. The same author, dwelling on the frog-test for strychnia, asserts that this test is not to be trusted, inasmuch as other poisons produce the tetanic symptoms, although in a lesser degree.—*Brit. Med. Jour.*

ON THE COMPARATIVE VALUES OF THE COMMERCIAL VARIETIES OF BUCHU LEAVES.

By P. W. Bedford.

"What are the actual values of the commercial varieties of Buchu Leaves, based on the proportion of volatile oil they will yield?"

There are found in commerce, three varieties of Buchu, known as long, medium, and short. Their monetary value is in the same order, the long Buchu (at the present time) being worth 80 cents per lb., while the short Buchu can be had for 30 cents. The second commercial variety, known as medium, has not been in the market in this city for several months. Owing to this fact, my experiments have been confined to the two varieties, long and short.

The long Buchu, known as Barosma serratifolia (Willdenow), is the variety most highly esteemed, but my experiments show that it contains much less volatile oil than the Barosma crenulata or short-leaved Buchu. These experiments have been made on quantities varying from 9000 to 15,000 grains of the leaves. My experiments with the long-leaved Buchu gave respectively 0·62, 0·68, 0·64, and 0·71 per cent., being an average of 0·66 or two-thirds of one per cent.

Similar experiments with the short-leaved Buchu gave respectively 1·60, 1·16, 1·07, and 1·02 per cent., being an average of 1·21, or one and one-fifth per cent.

The only recorded analyses of Buchu leaves I have met with are those of Brandes, made in 1827, and another made the same year by Cadet de Gassincourt.

Brandes' analysis sets the amount of volatile oil at 0·88 per cent., that of Cadet de Gassincourt at 0·665 per cent. The variety of Buchu is not stated.

In Stillé's Materia Medica and Therapeutics, vol. 2, p. 673, it is stated that Buchu yields seven per cent. of volatile oil, which statement is evidently an oversight or misprint.

New York, August, 1863.

ON THE PRESERVATION OF VOLATILE OILS.

By Alfred B. Taylor.

While the importance and the difficulty of preserving the volatile oils from the deterioration to which they are all so prone are universally recognized by the pharmaceutist, the two great destructive agencies by which they are beset are so universally diffused, that there seems to be little that can be suggested beyond what is familiarly known, calculated to secure the great desideratum. So far as we are at present aware, the only decomposing influences to which they are usually exposed, and by which they are likely to be attacked, are atmospheric oxygen and light, (to which latter might be added its natural analogue—heat.)

Whether these agents are merely co-operative, or whether they are indpendent,—that is, whether heat and light merely present more favorable conditions, whereby the affinities of the air for the oils are enhanced and accelerated,—or whether they are capable of exerting their own specific action in disturbing the primitive structure of the oils themselves, has not been definitely established, and would require a course of tedious and difficult experiment certainly to determine.

Inasmuch as the bottles from which the apothecary must dispense these oils are necesarily uncovered very frequently, and exposed to the air almost constantly, it is evidently of the first importance that this evil should be reduced to a minimum by using bottles of the smallest practicable size, containing not more than the retail supply for a week or so, and that these should be very closely stopped; or, in others words, that the bulk of any one of the said oils in store should be distributed among a number of small receptacles, so that each one may be exposed to opening for but a short period, and at the same time may expose, within the receptacle, but a small surface, to a small volume of inclosed air. If this expedient of division were more generally resorted to, there can be no doubt that the apothecary would have the satisfaction generally of dispensing a much "fresher" article, and would in that satisfaction be fully compensated for the increased trouble or expense attendant on the multiplication of containing vessels, and their storage bulk. It would perhaps facilitate, and

Fig 1

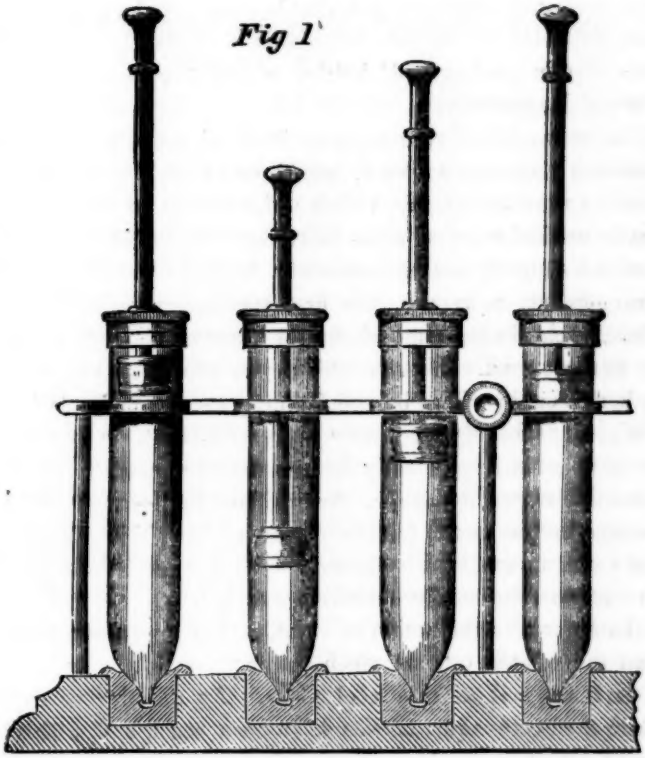


Fig. 2.

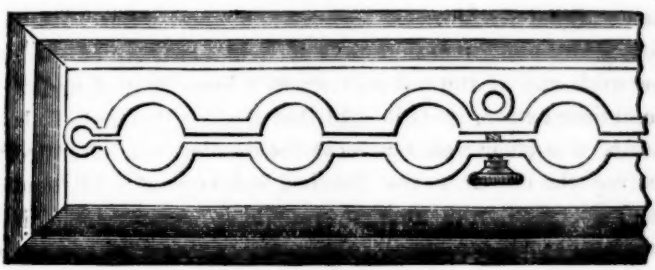


Fig. 1. VIEW OF SYRINGE BOTTLES IN POSITION, WITH THE BASE OR PEDESTAL SHOWN IN SECTION.

Fig. 2. TOP VIEW OF PEDESTAL AND SUPPORTING FRAME.

more certainly ensure, this desirable result, if the wholesale druggists, importer, or manufacturer, should originally put up the various oils in packages of bottles of small capacity, instead of those of larger bulk.

The only method that suggests itself of entirely excluding air from the dispensing vessel, would be to employ glass syringe bottles as the containing vessels; the points of the syringes to rest in conical seats of glass (forming the base or pedestal,) and to which they should be accurately fitted by grinding. By this arrangement, moreover, the first tendencies to form sediment would be checked or removed, by the lower portion of the oils being the earliest used. How far this device presents a practicable expedient, could perhaps be satisfactorily determined only by actual trial. It is hardly necessary to remark that, in any case, the bottles should be perfectly dry, as water appears to oxidise the oils quite as readily as air. An incidental advantage of the use of syringe bottles is the facility presented for graduation, whereby the quantity on hand is directly indicated, and the necessity of as intermediate measure entirely avoided.

In regard to the action of light, it has long been recognized that the volatile oils are much better preserved by being kept in a dark as well as in a cool place. As an obvious expedient, blackened or opaque bottles have been used, and with very decided advantage. One inconvenience, however, attending the use of non-transparent vessels, is the impossibility of observing the condition of the contained oil or other fluid,—a matter sometimes very desirable.

Inasmuch as the orange rays of light (or those of the least refrangible end of the solar spectrum,) have been found to exert no actinic action, it is thought that the employment of glass bottles of this color would present the desideratum of entirely protecting the oils from the chemical influence of light, and at the same time of allowing their amount and appearance to be distinctly perceived. Of course, all those preparations of the essential oils liable to change, such as orange-flower water, rose water, &c., would be equally well shielded, and would, indeed, be better preserved than by the means usually employed to exclude light. The means here suggested would be equally advantageous for the

preservation of all those chemicals particularly prone to deterioration from exposure to light.

It will perhaps be considered unnecessary to advise that, (in the absence of bottles of the above description, all essential oils should be kept in a dark closet,—as it is only saying what everybody knows,—still, since everybody does not at all times practise what he knows to be best, it is earnestly recommended to every apothecary, who wishes to satisfy himself or his customers, to try the expedient, and he will be amply repaid for any trouble or inconvenience resulting therefrom.

Proc. Amer. Pharm. Association, 1863.

PREPARATION OF CHLOROPICRIN.

By Samuel Priestley.

This substancce, which has usually been prepared by distilling picric acid with hypochlorite of lime, may be prepared from methylic alchohol directly—a fact which establishes beyond doubt the connection of chloropicrin with the methyl series.

I succeeded in obtaining the substance in the following manner :—

Bleaching powder is introduced into a flask, with as much methylalchohol as will form a paste. After mixing the materials, the flask must be placed in a shallow basin of cold water, in order to prevent the volatilisation of the spirit by the heat disengaged.

When the chemical action has subsided, nitric acid is added carefully and by small portions at a time, allowing the action to subside each time, the flask remaining still in the water.

The whole, when dissolved, is submitted to distillation. During the distillation a gas is evolved, which burns with a green flame, and may be collected over water. It is probably chloride of methyl, but I have not examined it further. This product which collects in the receiver appears to be a mixture of chloroform, chloropicrin and wood-spirit. These substances are afterwards separated by distillation ; the chloropicrin, having a higher boiling point, remains behind.

In actual reaction it is very probable that chloroform is first

produced, and that the nitric acid reacts according to the following equation:—

$$CHCl^3 + \left.\begin{matrix} H \\ NO^2 \end{matrix}\right\} O = CNO^2Cl^3 + \left.\begin{matrix} H \\ H \end{matrix}\right\} O^*$$

The odor and oily appearance of the substance leave no doubt as to its true chemical nature.—*Chem. News, London, Jan.* 2, 1864.

ON THE THERAPEUTICAL PROPERTIES OF SANGUINARINA, AND ITS ACETATE AND SULPHATE.

By Robert P. Thomas, M. D.,

Professor of Materia Medica in the Philadelphia College of Pharmacy.

Having been requested by the Association to prepare "an essay on the actual merits of Sanguinaria as a therapeutic agent based on trials with Sanguinarina and its salts, and its claims to a prominent position in the Materia Medica," I submit the following as the results of a large number of observations made by myself, or by other gentlemen at my request. Before stating my own experience, however, it is manifestly proper that a brief notice should be given of the recorded labors of others, in order that a just estimate may be formed of the true characters of this valuable drug.

In 1803, Dr. Wm. Downey, of Maryland, presented an inaugural thesis on the Blood-root, the root of which he designates as a powerful emetic in doses of twenty grains, causing much irritation of the fauces, then warmth in the stomach, increased force and frequency of the pulse, followed by nausea and vomiting. Two to four grains may occasion nausea. A small quantity snuffed up the nose produces violent irritation.

Dr. Smith, of Wilkesbarre, Penna., used for some years, with great success, the powdered root in jaundice. He administered it in doses of fifteen or twenty grains. (Philad. Med. Museum, vol. ii. p. 160, 1806).

In 1824, Dr. James F. Dana, of N. Y., discovered the active principle, and his assistant, Mr. Augustus A. Hayes, of Windsor, Vt., gave the following process for its preparation:

Thoroughly exhaust the contused root by successive macerations in water acidulated with sulphuric acid: filter, add water

* Carbon = 12. Oxygen = 16.

of ammonia as long as a precipitate falls ; decant and wash on a filter, first in water containing a little ammonia, and then in pure water, to get rid of the ammonia. Macerate the precipitate in alcohol, filter, distil off three-fourths of the alcohol, and pour the remainder into eight times its bulk of water. Collect and wash the precipitated sanguinarina.

The late Dr. William Tully carefully investigated the therapeutical properties of the blood-root. His first paper was published in the New England Jour. of Medicine and Surgery, vol. viii. p. 106, 1819. His second paper, or "Prize Essay," on the same subject, is an elaborate and exhaustive article, detailing the observations of himself and others on its effects in different diseases. (See Amer, Med. Recorder, vol. xiii. p. 23, 1828.)

In a third article, (see Boston Med. and Surg. Jour. p. 247, 1832), treating of the active principle, he says, that sanguinarina or its tartrate, given in large doses, causes vertigo, dilatation of the pupils, staring and protuberance of the eyes, a haggard expression, nausea, coldness of the extremities, cold sweats and diminution of the frequency and irregularity of the pulse.

Another ardent investigator of the properties of our indigenous plants, Dr. W. Zollickoffer, of Maryland, had his attention directed, about the same time as Dr. Tully, to the Sanguinaria Canadensis. He used a saturated tincture of the root as a tonic, in doses of eight or ten drops three times a day. In acute rheumatism he gave beneficially thirty drops of this tincture combined with eight drops of laudanum every three hours until nausea was induced. (Philad. Jour. of Medical and Physical Sciences, vol. vi. p. 295, 1823).

That it is poisonous in large doses is painfully proved by the following fact: In July, 1841, four persons, while engaged in cleaning the Apothecary Department of Bellevue Hospital, N. Y. found a demijohn containing the tincture, of which they drank freely, mistaking it for liquor. They were all seized with racking and burning pains in the mouth, throat, stomach and bowels, and a tormenting thirst. Having concealed from the physician what they had done, restorative measures were not resorted to until too late, and death ensued in each case on the following day. (Amer. Jour. of Med. Sci. p. 506, Oct., 1841.)

In consequence of its local action, bloodroot has been much employed as a resolvent. Thus, Dr. R. G. Jennings, of Va., asserts that a weak vinegar (℥½ macerated for a few hours in Oj. of vinegar) is superior to any gargle he has ever used in the sore throat of scarlet fever, especially when the larynx appears to be seriously implicated. (Stethoscope, vol. ii. p. 183, Richmond, 1852.)

Dr. Brice, of Newark, Ohio, reports three cases of nasal polypus cured by the direct application of bloodroot in powder and decoction. (West. Jour. of Med. and Surg. vol. ii. p. 237, Louisville, 1840).

Dr. Lewis Shanks also reports a case of the same disease cured by similar means. (Amer. Jour. Med. Sci. p. 368, Oct., 1842.)

As an emetic, Dr. Henry West thinks the bloodroot ranks intermediately between ipecacuanha and tartar emetic, being more nauseating than the former and less prostrating than the latter. He gives ten grains of the powder, or two fluidrachms of the tincture, every twenty minutes, until vomiting is produced. He considers it highly beneficial in croup and laryngismus stridulus. (Western Lancet, vol. xi. p. 441, 1850.)

Most of the writers already quoted, and many others that might be named, speak in terms of commendation of an alterative or deobstruent property of bloodroot, and therefore recommend its employment in jaundice. But they generally use it as an adjuvant rather than as the principle remedy. Dr. J. L. Mothershead, of Indianapolis, is an exception to this remark. He sums up ten years' experience by asserting strongly its alterative properties. In jaundice, after giving a portion or two of calomel, he exhibits from thirty to sixty drops of the tincture three times daily in compound syrup of sarsaparilla. In a few days the yellow tint leaves the skin. (N. West. Med. and Surg. Jour. p. 369, 1849.)

Another property of great value is thus described by Dr. Isaac Thorn, of Yellow Springs, Ohio, after a large experience with the drug. "It is a sedative of no ordinary powers. For reducing the force and frequency of the pulse at the same time without prostrating the system, it is one of our most efficient remedies. Its sedative effects are exerted slowly, not being per-

ceived until after the medicine has been administered 24 to 48 hours, and then come on very gradually." (Western Jour. of Med. and Surg. p. 397, 1847.)

The foregoing extracts, illustrating the observation and experience of practical physicians whose attention had been directed to the plant under consideration, show conclusively that it is entitled to a more extended trial, with a view to determine "its claims to a prominent position in the Materia Medica."

In order to resolve the question referred to me, concerning the actual value of the alkaloid existing in bloodroot, and the salts formed from it, I obtained from Messrs. W. S. Merrill & Co., of Cincinnati, a portion of the sulphate of sanguinarina, and I had the pure alkaloid and the acetate prepared therefrom by Mr. W. R. Warner, of this city, whose well-known accuracy as a chemist is a sufficient guaranty of the genuineness and purity of the specimens subjected to therapeutical investigation.

Sanguinarina, as procured from the sulphate, is a yellowish-gray powder without odor, and almost without taste. A slight acrimonious impression is developed after a time upon the tongue from the partial solubility of the alkaloid in saliva. Snuffed into the nostrils it causes, after a few minutes, a burning sensation followed by sneezing. It is nearly insoluble in water, sparingly soluble in glycerin, and soluble in chloroform and ether, and in a large quantity of alcohol.

Sulphate of Sanguinarina is a granular powder, of a bright vermillion-red color, without odor, but having an extremely acrimonious taste. The acrimony is particularly manifested in the throat. It is freely soluble in water, soluble in glycerin, and in a large quantity of alcohol and syrup; but nearly insoluble in chloroform and ether. Ammonia precipitates it from a watery solution. The precipitate is not redissolved by an excess of ammonia.

Acetate of Sanguinarina is in dark brownish-red scales. It has no odor. The taste is less acrimonious and more slowly developed than with the sulphate. It is slightly soluble in water, ether, and alcohol, but freely soluble in chloroform.

Therapeutical experiments with Sanguinarina (*the pure alkaloid.*)

I. Being in good health and engaged in my usual avocation, I

took one-twentieth of a grain of the alkaloid at 9 A.M., and at 1, 6, and 10 P.M., daily, for seven successive days. This experiment was instituted to ascertain the proper dose, as also the effects when continued for several days.

At the beginning of the experiment the pulse was 60, and continued about that rate for two days. Upon each of the five following days it stood at 60 in the morning, and at 52 or 53 in the evening. In health the pulse is usually rather more frequent in the afternoon, from exercise or labor. Here, however, the order was reversed. For in the afternoon, when affected by the remedy, the pulse fell to 53, but the influence of the sanguinarina being diminished or lost at night in the long interval from 10 P.M. to 9 A.M., the pulse rose to its ordinary rate in the morning.

The medicine was taken in the pill form. It occasioned no distress in the stomach, no action on the bowels (there having been but the usual daily evacuation), and no change in the character of the evacuation. The kidneys and skin were not influenced in any appreciable degree. There was no flow of saliva or uneasiness in the mouth, and there was no vomiting or even nausea for the first five days, but on the sixth and seventh days I was conscious of gastric discomfort.

II. In this experiment the quantity of the alkaloid was increased to one-tenth of a grain, which was taken four times a day for two successive days. The pulse at the commencement was 60, and at the close of the experiment it was reduced to 52. On the second day I experienced a feeling of warmth and uneasiness in the stomach about half an hour after each dose. I was not conscious of any other action on the system, excepting a slight sensation of fulness in the temples.

III. I administered to a girl, aged twelve, who had a hard, dry, racking cough, one-thirtieth of a grain every four hours for four days. Her usual pulse is 85. At the beginning of the experiment it was 104, and at the close of the fourth day it had fallen to 88. The cough in the meanwhile had become a little more loose, but, as the change was not very evident, I was obliged to discontinue the remedy to gratify the parents. The reduction of the pulse was the only apparent action of the medicine.

IV. One-fifth of a grain was administered to two patients every four hours for a day. Both patients complained of un-

easiness in the stomach after the second dose, which increased to nausea after the third and fourth doses. In each case the pulse was reduced, but the reduction appeared to be owing quite as much to the nausea as to any positive sedative effect of the remedy upon the heart.

Experiments with the Sulphate of Sanguinarina.

Having obtained by the previous trials a knowledge of the proper quantity to be administered, I placed in the hands of Mr. B. L. Bird, one of the Resident Physicians of the Episcopal Hospital, some of the sulphate, which he gave to a number of the patients, carefully watching the results.

He exhibited the remedy in doses ranging from one-tenth to one-half of a grain every three hours. In no case had we reason to think that it acted on the bowels, kidneys, or skin.

When given in doses of one-tenth to one-sixth of a grain, nearly all of the patients could take it every three hours for one or two days without experiencing nausea or much gastric uneasiness; and in every case but two the pulse was reduced five to ten beats in the minute, after the patient had taken it 36 to 48 hours.

In one case, three doses of a quarter of a grain each were given at intervals of two hours. After each dose the patient experienced warmth in the stomach and nausea. The last dose was followed by vomiting. The reduction of a few beats in the pulse, in this case, was probably occasioned by the sickness of the stomach.

In another case a single dose of a quarter of a grain produced nausea and slight vomiting. Half a grain was administered to another patient as an emetic, and the dose was repeated in fifteen minutes. Prompt and free vomiting occurred soon after the second dose, without undue retching or distress.

The following is a convenient mode of exhibiting the sulphate in solution as an expectorant:

℞. Sanguinarinæ sulphatis, gr. j.:
Aquæ, f℥j.
Solve et adde
Syrupi, f℥xv.
M.
Signa. Dose, a teaspoonful.

Experiments with the Impure Acetate.

I determined to try the acetate in an impure form, for the purpose of ascertaining whether the other principles associated with the alkaloid in the plant modify to an appreciable extent its action on the system. To effect this object, four ounces of the contused root were macerated in a pint of diluted acetic acid, then placed in a percolator, and a pint of percolate drawn off. This preparation is so acrid to the taste that a fluidounce of syrup will scarcely obtund the acrimony of a fluidrachm. This circumstance, after a trial of the medicine in ten or twelve cases of chronic bronchitis, induced me to have the remedy prepared in a more palatable form, as follows:—

Syrup of Sanguinaria.

℞. Contused bloodroot, ℥ij.
Diluted acetic acid. Oj.
Sugar, lbs. ij.

Moisten the root with a portion of the acid, place in a percolator, add the remainder of the acid, exhaust by percolation, and to the clear liquid add the sugar, and dissolve by a gentle heat.

The strength of this preparation is one ounce to a pint of syrup, and the dose is a teaspoonful.

The syrup was extensively used at the Episcopal Hospital during last winter and spring, having been given in more than an hundred cases of diseases of the throat and lungs. It was generally administered in combination with an equal quantity of syrup of Tolu.

The results of the trials with the syrup may be briefly stated thus:—When given regularly at short intervals for three days or longer, the patient would speak of an uneasiness in the stomach, or nausea, and, as a consequence, of impaired appetite. The pulse remained at about its previous average, or was slightly diminished in frequency. The bowels were not relaxed, nor did constipation follow its employment.

The syrup is a good expectorant. During its use the patient could separate and raise the mucus with less difficulty, and the secretion of mucus appeared to be diminished.

The condition of the brain was carefully observed, but no evidences of a narcotic action were manifested. It is true that

several of the patients slept better at night, but this seemed to be due more to the relief of the cough than to a specific narcotic action of the drug.

As the result of the various experiments above alluded to, and partly described, I think the following conclusions may be considered established, viz. :—That Sanguinaria and its salts, when given in doses ranging from one-twelfth to one-eighth of a grain, act as an expectorant, promoting the discharge of the mucus from the lungs without disordering the stomach to any considerable extent.

When given in quantities of one-sixth to one-fourth of a grain at intervals of two or three hours, most persons experience nausea after each dose, and some actually vomit.

If half a grain be given in solution every ten minutes, vomiting will almost certainly ensue after the second or third dose.

If the eighth or the sixth of a grain be given every three hours for two or more days, the pulse will generally be reduced from five to fifteen beats in a minute, thus showing a decided sedative impression on the heart, which impression, however, is slowly developed, and ceases soon after the medicine is discontinued. The reputed effects of bloodroot upon the liver, and as an alterative, have not been produced by sanguinarina or its salts upon myself or others subjected to experiment. The alkaloid sanguinarina is certainly the most valuable principle existing in the bloodroot, but I am persuaded it is not the sole agent, as some trials made with the impure resin show that the latter also possesses nauseant and emetic properties.

Proc. Am. Pharm. Assoc., 1864.

SOURCE OF SULPHUR.

Until within the last few years Sicilian sulphur was almost exclusively employed in this district for the manufacture of sulphuric acid—the pyrites from Wicklow being the only other source of supply. This latter, however, was not sufficiently abundant to render the manufacturer independent of the great fluctuations which have recently taken place in the price of sulphur, on account of the demand consequent on the vine disease. During the last few years the following additional sources of sup

ply have become available:—1st, Belgian; 2d, Norwegian; 3d, Spanish or Portuguese; 4th, Italian; 5th, Westphalian pyrites. 1. The Belgian pyrites has the advantage of being shipped at Antwerp at a moderate freight to the Tyne. It is a very hard, compact material, containing about 50 per cent. of sulphur, and therefore nearly approaches a pure bi-sulphuret of iron. The burnt residue from one manufactory on the Tyne (the Walker Alkali Works), after being roasted in a lime-kiln to burn off the small remaining portion of sulphur, is regularly used as an iron ore at the adjoining iron works. It contains no copper, and from 3 to 5 per cent. of arsenic. 2. The Norwegian pyrites is shipped at Levanger. It contains 44 per cent. of sulphur, is easily broken, and does not readily flux in the kiln. The quantity of copper it contains being less than ten per cent., the burned residue cannot be profitably smelted for copper. 3. The most extensively used pyrites is shipped from Huelva, in Spain, and Pomeron, in Portugal. The mines are situated on each side of the boundary between the two countries. They were most extensively worked in ancient times, but their recent development has arisen from the use of the ore as a source of sulphur. Containing only two to four per cent. of copper, it was unable to compete with the richer ores which from time to time became available in different parts of the world, but the mining is now rendered profitable by the value of the sulphur being realisable as well as that of the copper. The percentage of sulphur varies from 46 to 50. The practical difficulty of burning this ore, namely, its great fusibility at the point where the combustion of the sulphur gives rise to considerable heat, has been overcome by the adoption of kilns, first used in Lancashire, in which the area of the surface is large in proportion to the weight of the charged pyrites. The use of cupreous pyrites has led to the introduction of the manufacture of copper on the Tyne, which will this year amount to between 700 and 800 tons. The ordinary process of smelting is employed, —but the moist method is also being tried, the advantage being that, by this method, all the ingredients of the mineral are utilised, the oxide of iron making an ore of similar quality to hematite. The smelting process, however, is still preferred in the large manufactories. In 1860 several cargoes of an ore contain-

ing free sulphur imbedded in gypsum were imported from the Island of Milo, in the Archipelago. From the small quantity of sulphur contained in it (19 up to 24 per cent.) there was great difficulty found in burning it, except the large masses. Subjoined is an analysis of one parcel of it:—Sulphur, 24·00; gypsum, 62·20; sand, &c., 6·00; water, 7·00. Still more recently, Professor Anstead has discovered a deposit of free sulphur in Corfu, of which he has been kind enough to forward a sample, but we believe it has not been used in commerce. When sulphuric acid is wanted quite free from arsenic, Sicilian sulphur must be used. So largely has pyrites displaced sulphur in the production of sulphuric acid, that in 1862 only 2030 tons of sulphur were consumed, against 72,800 tons of pyrites; and, reckoning the above quantity of sulphur as equivalent to 4500 tons, it appears that 77,300 tons of pyrites are annually used for the manufacture of sulphuric acid, along with 2500 tons of nitrate of soda. Assuming a produce of 120 per cent. on the pyrites, this is equal to a production of 92,760 tons of sulphuric acid, calculated as concentrated. This quantity of sulphuric acid is nearly all consumed where it is made, for the manufacture of other chemicals, such as soda and manures, the quantity sold being 64·40 tons; but this might be more correctly described as consumed in other works, for the quantity sent to a distance is very small. Four-fifths of the sulphuric acid is used for the decomposition of common salt. —*Chem. News, Sept.* 12, 1863.

NOTE ON THE GUM-RESIN OF THE BALSAM OF PERU TREE.

By Dr. Attfield.

The naturally-exuded resin of the *Myroxylon Pereiræ*, as furnished to me by Mr. Hanbury, consists of

	In 100 parts
Resin	77·4
Gum	17·1
Woody fibre	1·5
Water and a small quantity of volatile oil, about	4·0

The *resin* is an acid, its alcoholic solution feebly reddening litmus-paper, and is uncrystallizable. The *gum* is similar to that of gum arabic. The *volatile oil* is limpid, colorless and fragrant.

Submitted to destructive distillation the exudation yields an acid water, empyreumatic oils gradually darkening in color, and a pitchy residue which ultimately chars to a cinder. It contains no cinnamic acid.

This exudation is obviously therefore a gum-resin similar, for instance, to that of ammoniacum, and though found on the bark of the tree yielding the black fluid Balsam of Peru is apparently quite distinct from the latter substance, the one having no apparent relation to the other.—*Pharm. Journ.* Dec., 1863.

ON THE SOLUBILITY OF SOME THALLIUM SALTS.

By William Crookes, F. R. S.

The following table is the result of many careful experiments. The figures may be relied upon as accurate:—

One part of Thallium		Water at 60° F.		Boiling water.	
Protochloride	dissolves in	283·4	parts.	52·5	parts.
Sesquichloride	"	380·1	"	52·9	"
Iodide	"	4453·0	"	842·4	"
Plantinochloride	"	15585·0	"	1948·0	"
Sulphate	"	21·1	"	5·4	"
Nitrate	"	9·4	"	—	"
Carbonate	"	24·8	"	3·6	"
Oxalate	"	69·3	"	11·0	"
Binoxalate	"	18·7	"	—	"
Phosphate	"	201·2	"	149·0	"
Terchromate	"	2814·0	"	438·7	"

The nitrate and binoxalate dissolve in considerably less than their own bulk of boiling water, forming a syrupy solution.

The insolubility of the platinochloride is remarkable. It may be of interest to compare it with the corresponding potassium, ammonium, rubidium, and cæsium salts:—

One part of Plantinochloride of		Water at 60° F.		Boiling water.	
Potassium	dissolves in	108·	parts.	19·	parts.
Ammonium	"	150·	"	80·	"
Rubidium	"	740·	"	157·	"
Cæsium	"	1308·	"	261·	"
Thallium	"	15585·	"	1948·	"

Chem. News, Jan., 1864.

ON THE MANUFACTURE OF BALSAM OF PERU.

By Daniel Hanbury, F. L. S.*

It is now thirteen years since the late Dr. Pereira laid before the Pharmaceutical Society of Great Britain some account of the process by which the liquid known as *Balsam of Peru*, is prepared in the State of Salvador in Central America, and at the same time described, so far as the imperfect materials at his disposal would allow, the tree from which the Balsam is obtained. Subsequently to this, namely in the year 1860, Dr. Charles Dorat of Sonsonate in the State of Salvador communicated to the *American Journal of Pharmacy* a notice of the manufacture of Balsam of Peru completely confirmatory of that given by Dr. Pereira, which account was republished in the *Pharmaceutical Journal.*

The Balsam-tree, which Pereira at first regarded as *Myroxylon pubescens* HBK, was afterwards called by him provisionally (until materials for a complete botanical description should be obtained) the *Myrospermum of Sonsonate.* Upon the death of Pereira, the late Dr. Royle drew up in botanical terms a description of the tree, upon which he conferred the name of *Myrospermum Pereiræ*, which in 1857 was changed by Klotzsch of Berlin to *Myrozylon Pereiræ*, he maintaining the distinctness of the two genera *Myrospermum* and *Myroxylon*†.

The question of the origin of Balsam of Peru having been thus elucidated, there may seem little reason for again bringing it before the Society; but having received within the last fortnight, through the kindness of Dr. C. Dorat, somewhat ampler information upon certain points, accompanied by some excellent original sketches representing the collection of the balsam at Juisnagua, near Sonsonate, I think the subject sufficiently interesting and important to deserve further attention. I am the more strongly of this opinion because I find that continental pharmacologists are by no means agreed as to the botanical origin and place of production of the balsam, or even as to the mode of its manufacture, one of the most recent wri-

* Communicated by the author.—Ed. Am. Ph. Jour.

† *Bonplandia*, 15 Sept. 1857, p. 274.

ters describing it to be obtained by boiling the bark and branches' or else by destructive distillation like tar, and two others naming four species of *Myroxylon* as being probably employed to yield it.

Dr. Dorat, with whom I have interchanged letters occasionally for some years, and from whom I recently requested information upon certain points connected with the history of Balsam of Peru, thus replies to the inquiries contained in my last letter.

"As I presume that you are writing a description of the Balsam-tree, I send you by return steamer the required answers to your questions, together with a specimen of the naturally-exuded resin, and a few beetles which are invariably found under any part of the decayed bark of the *Myrospermum*.* That no possible mistake might exist on my part, I rode to Juisnagua, it being still the collecting season, and took a sketch of the process, which, with a verbal description, will, I trust make all clear to you.

Now to answer your questions:—as to the *natural* or *spontaneous exudation*. In young trees, say, until the sixth or eighth year I have never seen any. After that age a greenish resin is frequently found during the summer months on the northern side of the trees when they are at rest, that is from December to May. It is at first frothy and of a pale yellow color, but as it becomes hard it changes to green. It occurs in small quantities and is difficult to get clean, as it is very sticky. It has a slightly bitter taste, but no aroma. The Indians consider that the trees which produce much of it yield an inferior balsam. This, however, is only one of their many superstitions concerning these trees. The largest quantity I have myself seen was upon a very old tree; it appeared in large tears lying one over the other, almost like grapes.

Early in the months of November or December, or after the last rains, the balsam-trees are beaten on four sides of their stems with the back of an axe, a hammer, or other blunt instrument until the bark is loosened, four intermediate strips being left untouched that the tree may not be injured for the next year. Five or six days after, men with resinous torches, or bundles of lighted wood apply heat to the beaten bark, which becomes charred. It is left eight days, during which the burnt pieces of bark either fall or are taken off. As soon as they perceive that the bare places are moist with the exuding balsam, which takes place in a few days, pieces of rag (of any kind of color) are placed so as entirely to cover the bare wood. As these become saturated with the balsam, which is of a light yellowish color, they are collected and thrown into an earthenware

* Mr. Francis Walker, who has been good enough to examine this insect, considers it identical with the *Passalus interstitialis* of Percheron.

boiler, three-quarters filled with water, and stirred and boiled gently until the rags appear nearly clean, and the now dark and heavy balsam sinks to the bottom. Fresh rags belonging to the same owner are continually being put into the boiler until sun-down, when the fire is extinguished; when cold the water in the boiler is poured off, and the impure balsam set aside. During this process the rags that appear to have been cleared of balsam are taken out of the boiler at different times and given to a man to be pressed, by which means much balsam is still obtained. The press consists of a small open bag about fourteen inches long, made of stout rope fixed together with twine, open at the middle and looped at both ends to receive two sticks. The rags are placed inside, and the whole is twisted round by means of the sticks and the balsam thus squeezed out. A washer-woman wringing out a wet cloth, fairly represents the process. The balsam thus procured is added to that in the boiler. The next day, the cold balsam is weighed and put into *tecomates* or gourds of different sizes and sent to market:—its price at present is 5 reals per pound. If it is wished to purify it, the boiler is left standing for several days, when the impurities float to the surface and are skimmed off. A little water is also left to float at the mouth of the tecomate when brought for sale. These *tecomates* are tied up in plantain leaves, with a stopper of the same.

A very fine quality of balsam is collected from the broken pods in the same manner as above.* It requires more trouble and care to collect, and there being no demand for it, it is scarcely ever met with. I believe it is known as *Balsamo blanco*. From the flowers there is distilled a most delicious and fragrant *aguardiente*, far superior to any brandy.

A healthy tree will produce balsam well for about thirty years, after which, if allowed to remain untouched for five or six years, it will again produce. The collecting begins shortly after the last rains, that is, some time in November, and is supposed to be finished in May. During the rains none is collected. In the dog-days, that is from the 15 July to the 15 August, there being scarcely any rain here, a small quantity is collected by a few enterprising Indians.

The beating, and application of rags is only made during four days of each week, that is four *cosechas* (harvests) per month. Should the flow of resin decrease, fresh beating and rags are applied, and after eight days the boiling is resumed, and so on as long as the dry season permits. It was formerly the practice to apply fire to cuts made in the bark and to allow the exuding resin to burn for a short time: now after a good beating the bark is only heated by torches or burning wood.

I believe I mentioned to you that before the conquest and for a short time after, balsam formed a part of the tribute paid to the chiefs of Cus

* It is more probably made by simple expression, and not by boiling.—D. H.

catlan, the chief department of the State (now S. Salvador), and was brought from the coast in earthenware jars representing the *pajuil* or Mexican pheasant (*Crax globicera*). Many of these old jars are now found in the mounds and excavations of the ancient *pueblos* on the coast. I send you a copy of a broken one in the possession of our worthy Bishop. It is one-fourth the original size. The *pajuil* feeds on the young nuts, and is found in great numbers on these trees during the season.

The small *pueblos* scattered over the so-called *Balsam Coast* are numerous. The principal ones are :—

Juisnagua, a moderate-sized pueblo, about six leagues from Sonsonate, formerly rich in cacao, but at present of small account. It is the first town where balsam is produced ; there are in the vicinity about 400 balsam-trees.

Tepecoyo, or Coyo, (Indian *Mount of Wolves*), on an elevated ridge, the valleys on either side being well watered, is situated twelve leagues S. E. of Sonsonate. About a league south of the town their is a gold mine, which was opened in 1832, and the ore sold in Guatemala. Owing to the depravity of the Spanish miners, the Indians rose against the owner and expelled him, since which they will not allow any one even to visit it. The produce of this pueblo in balsam is small, having been last year only sixty arobas of twenty-five pounds.

Tàmanique, situated in a circular valley, surrounded by very high and heavily timbered mountains, among which are numerous tigers, wild hogs, lions (puma), and four-fingered green monkeys. Vanilla is plentiful, but not of the finest quality. There are at present worked 1400 balsam-trees, producing about 160 arobas yearly. In the vicinity are 1500 cacao-trees of fine quality producing seventy arobas of cacao-beans. The Indians are a drunken and superstitious race.

Chiltiuapan, near the sea, on an elevated and extensive plateau, between two rivers, the Sonto and Sonsapuapa, running to the sea, with fine fish, and numerous caymans. The dense forests surrounding this pretty pueblo, contain 2569 balsam-trees, producing 450 arobas of balsam, value about $3500. The next article of value is cacao, of which there are 1700 trees, value of produce this year $830. The Indians of this pueblo are honest and very industrious, as besides the balsam and cacao they have now coffee plantations, and grow much Indian corn. The dress of the women consists only of a small petticoat, crimson, with a black stripe. They speak the Nahuat idiom.

Talnique, at the foot of the Cerro del Tamagas, or Snake-hill, situated on a most extensive and fertile plain, six leagues from Sonsonate, S. E. There are not above 500 balsam-trees about this pueblo. It is more noted for its fine qualities of timber, vanilla and cacao. It is from this vicinity that the best *mora* (fustic) is obtained, and also the finest grained rosewood (Grenadilla). The streams, of which there are several, abound in

leeches, which are often sold in Sonsonate at four reals each. The Indians being in constant communication with Sonsonate are a vicious and lazy race. As in most of these pueblos, the wild animals commit great ravages among the cattle.

Jicalapa, situated on a small plain, about three leagues from the beach, intersected by deep gulleys, (*barrancas*), heavily wooded, principally with large cedars. The Indians are an idle race, and only cultivate about 1200 balsam-trees although many more exist in the dense woods, which remain uncleared. The heat is very great, and the climate most unhealthy. Maize is mostly cultivated, and plantains are numerous. The animals are tigers, pumas, warris, ant-eaters (two varieties), armadilloes and large black monkeys, which form a great portion of Indian delicacies.

Teotepeque, a small pueblo, situated on a beautiful eminence sixteen leagues from Sonsonate and one league from the sea. The climate is very hot, often 105° F. in the shade, but from its elevation very healthy. The men wear a scanty breech cloth, and the women only an apology for a petticoat. They are the most debased of all the Indians of the coast, plant a little corn and live principally on fish and every kind of animal, including their favorite dish the Iguana. There are plenty of balsam trees on the slopes of the mountains, but not above 300 are worked. They sell their balsam to the neighboring pueblos in exchange for *manta*. The hills also produce sarsaparilla, and several gums, incense, etc.

Comasagua.—This town, although producing a little balsam, does not belong really to the balsam coast, being nearer San Vicente. There are about 1000 trees, but their cultivation has been nearly abandoned for that of coffee, the climate being cool and appropriate to that plant. The balsam is sold in San Salvador. They have vanilla, maize, wheat, rice, potatoes, peaches, and a variety of fruit to supply the market of San Salvador. The inhabitants are mostly Ladinos, very steady, brave, and industrious. The dress of the women changes here to red and blue checkered.

Jayaque.—This town, which from records has existed for 260 years, is situated on the fertile declivity of a mountain called La Cumbre, a few leagues from Izalco, and near the hot river Cachal. There are about 1000 balsam-trees under cultivation. Sugar, however, is the principal branch of industry, value this year in *panela* or moist sugar $4000. The forests abound in fine woods, mahogany, cedar, rosewood, fustic and laurel, copalchi and a few quina trees, with sarsaparilla. About the year 1780, this town, then very large, was nearly destroyed by a flood of liquid mud, that issued suddenly from a small hill opposite ; a great portion of the inhabitants fled to the upper lands, and settled the present pueblo of Ateos, on the main road to San Salvador. The whole of these lands are volcanic, and form part of the volcanic group of Santa Ana and Izalco.

These are the principal towns trading in balsam, there are, however, many small villages and *chacras* or farms, having trees and working them,

with whose names I have not become acquainted. The Indian name of he balsam is *Hoo shi-it*, or *Oo sheet;* in Spanish it is called *Balsamo negro.*"

In addition to the sketches here referred to, and which are reproduced in the wood-cuts of this paper, Dr. Dorat has favored me with specimens of the Balsam-tree, *Myroxylon Pereiræ* Kl.; and as I have also received it from three other independent collectors, I do not feel the least hesitation in regarding it as the source of the whole of the Balsam of Peru of commerce. Dr. Dorat is himself of this opinion; and the late Mr. Sutton Hayes who was an excellent botanical observer, and who gathered specimens of the tree at Cuisnagua and in other places, assured me that so far as he knew, no other species of *Myroxylon* occurs on the Balsam Coast or in Guatemala.

Although there is some evidence to show that the balsamic exudations of one or two other species of *Myroxylon* or *Myrospermum* were formerly collected in other parts of tropical America and sent to Europe as *Balsam of Peru*, it is hardly on that account the less certain that for nearly three centuries the great bulk of the drug imported has had the same origin as that of the present day. At the period of the Spanish conquest, the balsam was an important production of the very region where it is still obtained, as is evidenced by it forming part of the tribute carried by the aborigines of the coast to the chiefs in the interior. It appears moreover, that the estimation in which it was held by the Indians was soon shared by their invaders; for in consequence of the representations of missionary ecclesiastics, Pope Pius V. was induced to issue a bill under date 1571, authorizing the use of the balsam produced in the country for the preparation of the Holy Chrism of the Roman Catholic Church. A copy of this curious document is still preserved among the archive of Guatemala (of which state Salvador was formerly a part), as well as in the Vatican at Rome.* Father Joseph de Acosta in his *Historia Natural y Moral de las Indias*, published at Seville in 1590, after referring to this fact, remarks that balsam is brought from New Spain and the provinces of Guatemala and Chiapas and others in those parts where

* *Vide* also *Pharm. Journ. and Trans.*, vol. ii. (1861) p. 446.

it most abounds, but that the balsam which is most prized, is that of Tolu.*

As to the balsam having acquired the name of Peru, a country so remote from its place of production, the circumstance is intelligible when we know that during the early period of the Spanish dominion, the productions of Central America were shipped to Calao, the port of Lima, the capital of Peru, and great emporium of its trade, and thence transmitted to Spain. From this cause the drug acquired the name of the country from which it was shipped to Europe, exactly in the same manner as *Turkey* Gum Arabic, *Turkey* Myrrh, *East India* Rhubarb, *Bombay* Senna, etc. having acquired and still bear designations very little indicative of their real origin. In proof of this I may quote an interesting passage occurring in De la Martinière's *Dictionnaire Géographique* (Paris, 1768), where under the head *Callao*, the author enumerating its imports, mentions as coming fron Sonsonate, Realejo and Guatemala, the *Balsam which bears the name of Peru*, but which, says he, *comes in reality almost entirely from Guatemala.* He adds that there are two kinds of it, the *white* and the *brown*, the latter being the most esteemed.†—*Lond. Pharm. Jour., Dec.*, 1863.

* . . . . Lo que mas importa es, que para la substancia de hazer Chrisma, que tan necessario es en la sancta Iglesia, y de tanta veneracion, ha declarado la Sede Apostolica, que con este Balsamo de Indias se haga Chrisma en Indias, y con el se de el Sacramento de Confirmacion, y los de mas, donde la Iglesia lo usa. Traese a España el Balsamo de la neuva España, y la provincia de Guatimala, y de Chiapa, y otras por alli es donde mas abunda, aunque el mas preciado es, el que viene de la Isla de Tolu, que es en Tierrafirme no lexos de Cartagena."—lib. iv. c. 28.

† " . . . Dans la même rue du côté du nord, sont les magasins des merchandises que les vaisseaux Espagnols apportent du Chili, du Pérou et du Mexique.

Du Chili viennent les cordages, les cuirs, les suifs . .

Du Mexique, comme de *Sonsonate, Realejo, Guatemala*, de la bray et du gaudron qui n'est bon que pour le bois, parce qu'il brûle les cordages; des bois pour les teintures, du souffre et du baume qui porte le nom de Pérou, mais qui vient effectivement presque tout de Guatemala. Il y en a de deux sortes, de blanc et de brun ; ce dernier est plus estime; on le met dans des cocos quand il a la consistance de la bray, mais communément il vient dans des pots de terre en liqueur, alors il est sujet à être falsifié et mêlé d'huile pour en augmenter la quantité."—De la Martinière, *Dictionnaire Géographique*, (Paris, 1758, fol.) Tome 2, p. 48.

WOOD SPIRIT AND ITS DETECTION.

By Emerson J. Reynolds.

(*Read before the Royal Dublin Society.*)

The products of the destructive distillation of various vegetable matters, in addition to those of primitive organic origin, have received more than ordinary attention and careful study at the hands of the chemist within the last ten or twelve years. Numerous highly complex acids, neutral substances, and bases, have rewarded the time and labor expended on their investigation, by the acquirement of both fame and riches for the discoverer—fame, owing to the great scientific value of the results, and riches in consequence of their practical application. The number and complexity of the compounds formed during the destructive process cease to surprise us, when we consider the ever-changing circumstances under which they are produced. To take an instance intimately connected with the subject of the present paper; let us suppose a block of wood placed in a close cylinder, and submitted to a gradually increasing temperature. The essential constituents of this block are carbon, hydrogen, oxygen, and nitrogen, all in different states of combination both on the surface and in the interior of the mass. On the first application of heat, the strictly organic structures are broken up superficially, their elements entering into new combinations, in which state they are volatilized. On the still further increase of temperature, the next succeeding layers undergo a similar process; but now, owing to the alteration of temperature, and probably in consequence of the different proportions and arrangements of the proximate constituents, another set of affinities come into play: the result of this is, as might be anticipated, the production of many new compounds, materially different from those preceding them. Thus the process continues, the products altering in character as the temperature fluctuates. Such being the case, it ceases to be a matter of wonder that the compounds formed should be both numerous and variable, or that the examination of these should open an almost inexhaustible field of research to the scientific explorer.

My object in laying the present communication before the

Society is to bring forward a new and reliable test for the detection of pyroxylic spirit, and likewise to give a brief preliminary notice of some experimental results which I have obtained in the course of an investigation undertaken with a view to the complete separation of the more volatile constituents of wood naphtha.

As pyroxylic spirit in its purest commercial form has been the subject of most of my experiments, it may be interesting to describe briefly the process by which it is manufactured on the large scale.

When wood is distilled in close vessels, and at high temperature, it yields a variety of products, which may be classed under three heads—solid, liquid, and gaseous. The solid and gaseous products, not being connected with our present subject, may be dismissed without further comment, our attention being solely confined to the liquid portions. The tarry mixture which is the result of the first operation is rectified, and the more volatile portions redistilled from lime or chalk, by which means the acetic acid, which is present in large quantity in the crude liquor, is got rid of. The distillate then constitutes the rough wood-naphtha of commerce. When required for medicinal use, this is further purified as follows:—The crude material is largely diluted with water, by which means the oily hydrocarbons always present are precipitated, the last trace of these being afterwards removed by the action of oxidizing agents. The very weak methylic spirit thus produced is then frequently rectified *per se*, and finally over quick-lime until the specific gravity is reduced to about 800. It then constitutes medicinal naphtha.

The spirituous liquid thus produced is far from pure, since it consists of a mixture of acetate methyl, of acetone, methylic alcohol, and other bodies, which have been as yet but very imperfectly examined. Were we to attempt to separate these impurities by fractional distillation alone, failure could only attend our efforts, as a comparison of the boiling points of the three bodies already mentioned will show.

Acetate of methyl	boils	at	133° F.
Acetone	"	"	133° F.
Methylic alcohol	"		149° F.

The separation of methylic alcohol can be easily effected by means of chloride of calcium, but other methods must be adopted for the purpose of investigating the remaining constituents of the spirit.

When studying the deportment of various metallic salts with the purified naphtha, I observed the following reaction :—When a little solution of chloride of mercury was mixed with a few drops of the spirit, and then excess of potash added, the oxide of mercury first thrown down was speedily redissolved with the production of a clear solution. This result can be obtained in the cold, but it is more rapidly brought about by the aid of a gentle heat. When acetic acid was added to the alkaline solution a yellowish-white gelatinous precipitate was formed, but slightly soluble in dilute acetic, nitric, or sulphuric acids, though readily dissolved by hydrochloric, which appeared at the same time to decompose it. The deportment of this precipitate, on the application of heat, when taken in connection with other considerations hereafter to be mentioned, necessarily led me to conclude that I had obtained a definite compound of mercury with one of the constituents of pyroxylic spirit.

A considerable quantity of the naphtha was now submitted to careful distillation, and the portions which came over up to and at 176° F. were collected. After remaining steady at this temperature for some time, the boiling point rapidly rose to 182° F., and this distillate was likewise collected apart from the rest. On testing the two portions with chloride of mercury and potash, as before described, the first distillate gave the reaction very strongly, and the second not at all. The more volatile liquid was now rectified repeatedly from lime, and afterwards saturated with chloride of calcium. The impurities were then distilled off with the aid of a water-bath ; and the liquid which collected in the receiver, when tested as before, exhibited the reaction remarkably well. The results of these experiments indicate, in the first instance, that pure methylic alcohol is not connected with the production of the mercurial compound ; and, secondly, that the body whose presence is essential to the resolution of the oxide of mercury has a low boiling-point.

From this time I commenced the investigation of the mercurial compound, and have since succeeded in tracing it to its ori-

gin, and making out its history to some extent, as well as its more important chemical relations. As this is a matter not essentially connected with the practical application of the test, I will reserve it for the subject of a future communication, merely stating here, that *acetone* is principally concerned in the production of the reaction already described.

I will now give the results of some experiments with the mercurial solution above referred to, which may serve to illustrate its more distinctive characters; I will then pass on to the description of a method for the detection of "methylated spirits."

EXPERIMENTS WITH MERCURIAL SOLUTION.—A portion of the liquid was evaporated *in vacuo;* after a few days, it had solidified to a firm, opaque jelly; after a little time longer, crystals commenced to sprout out from the edges, and continued increasing daily, until what was formerly a jelly had become covered with beautifully formed acicular crystals, many of the delicate reed-like tufts reaching far above the edges of the capsule, and growing as it were, out of a resinoid amorphous mass. Analysis proved that these crystals consisted merely of chloride of potassium, the difference in crystalline form from that usually observed being due, as is well known, to the modifying influence of organic matter. The gummy residue remaining in the capsule after separating the crystals was then examined with a microscope, and found to be totally destitute of crystalline structure, the detached pieces being smooth and rounded, very brittle, and semi transparent. When heated to a temperature of about 450° F., it swelled up considerably, at the same time evolving a quantity of mercurial and empyreumatic vapor, and leaving a voluminous residue of carbon. When the original solution was boiled violently, a white gelatinous precipitate was formed, readily soluble in dilute hydrochloric acid, though apparently but slightly acted on by the dilute acetic, nitric, or sulphuric acids.

Excess of acetic acid was now added to another portion of the alkaline solution, and the resulting precipitate thoroughly washed, and then transferred to a retort; some hydrochloric acid was now added, and the mixture distilled. The distillate, when tested with chloride of mercury and potash in the usual

manner, gave the reaction very strongly. Some solution of chloride of mercury and a few drops of the naphtha were mixed, and then excess of potash added, which caused the resolution of the oxide of mercury without the aid of heat. A portion of this solution, on the cautious addition of an acid, did not give any precipitate. The mixture was now gently warmed, and afterwards acetic acid added, upon which a precipitate was immediately formed.

From the results of these experiments, the following information may be gleaned:—1st. That the compound in question is somewhat resinoid in character and destitute of crystalline structure; 2ndly. It is precipitated by boiling, or on the addition of an acid; 3rdly. It is easily decomposed by hydrochloric acid, the organic body passing off unchanged; and 4thly. It is always necessary to employ heat previous to the addition of an acid, otherwise no precipitate will be produced immediately. A consideration of the first of these points, viz., the want of crystalline structure, the gelatinous appearance, and, in fact, the *colloidal* nature of the compound in question, led me to resort to the beautiful principle of "dialysis," as a means of freeing its solution from all saline impurities. In order to put this idea to the test of experiment, some of the mercurial solution was placed on a dialyser, floating on a considerable bulk of distilled water. After twenty-four hours, the diffusate contained a large quantity of chlorine, and but a very small proportion of mercury. The diffusion was then allowed to continue for eight days, during which time the water was changed twice a day. On the ninth day a mere trace of chlorine could be detected in the diffusate, and but little mercury. The liquid on the dialyser was almost odorless and colorless, and of high specific gravity; it was neutral to test-papers, and gave a copious precipitate both on boiling and the addition of acetic acid, thus demonstrating that the original compound was still present in the solution, apparently unchanged.

In my subsequent experiments I have found this method of separation most valuable, since it enables me to easily purify the colloidal mercurial compound from the crystalloids which accompany it in solution. The recapitulation of these, my earliest experiments, is sufficient to show the more important

relations of this peculiar compound, and likewise enables me to point out how this particular reaction may be made available for the detection of "methylated spirits."

DETECTION OF WOOD SPIRIT.—It is a well-known fact that the liquid sold under the name of "methylated spirits" is a mixture of ten per cent. wood-naphtha, and ninety of spirit of wine. The addition of the former communicates a very disagreeable taste and odor to the latter, thus rendering it unpotable, and, it is said, unfit for internal use. This mixed spirit, though easily recognized by its odor when alone, yet, if used in the preparation of many strong-smelling tinctures or essences, cannot be thus detected, and we are then obliged to resort to chemical means to aid us in the discovery of the adulteration. Up to the present time, but one test has been proposed for the detection of wood-spirit; this is generally known as "Ure's test," having been first mentioned by the eminent chemist of that name. This test simply consists in adding powdered hydrate of potash to the suspected liquid; if wood-spirit be present, the mixture becomes brown in about half an hour. That this is a simple, easy, and correct test when the spirit is unmixed with vegetable principles, I do not deny; but there is one serious source of error, which, I think, prevents it from being generally applicable to the detection of wood-spirit in alcoholic tinctures, and this I will now endeavor to make evident. In commencing the examination of a sample of any tincture, it is, of course, necessary to distil it, and apply the test to the distillate. We all know that most tinctures contain some volatile principles extracted from the plants used in their preparation; when these are distilled, the volatile oil, though generally of a high boiling-point, is dissolved in the vapor of the spirit, and thus contaminates even the first portions of the distillate. If to this we add caustic potash in powder, in many cases the liquid will assume a brown tint, even though wood-spirit is not present, owing to the well-known action of the alkali on many essential oils—thus indicating an adulteration which did not really exist.

The method which I adopt in testing for wood-spirit is as follows:—A small quantity of the suspected spirit is placed in a tube retort, and distilled over into a cooled test-tube; two or

three drops of a very dilute solution of chloride of mercury are now added to the distillate, and then excess of solution of caustic potash, and the whole well shaken. If the precipitated oxide of mercury does not redissolve even on warming the liquid, wood spirit is not present; should complete solution be effected, however, the mixture is warmed, and divided into two portions; to one acetic acid is added, which causes the formation of a yellowish-white bulky precipitate; the remaining portion is boiled, and a similar precipitate is thrown down, thus proving with certainty that wood naphtha is present. In applying this test, it is necessary to be careful not to add too much of the mercurial solution, as in that case an insoluble compound would be formed, and, as a consequence, a negative result arrived at.* When practised as I have now described, I look upon this test as being safe and reliable; at least, so far as my experience with it goes, I have always found its indications to be correct, and not liable to the ambiguity occasionally occurring with the potash test. I make this statement not on merely theoretical grounds, but from information gleaned in the course of a series of comparative experiments with pure tinctures, and those purposely adulterated with wood spirit. I trust that this reaction may prove useful as a means for the detection of an adulteration which, I am sorry to say, numerous analyses have shown me is practised to some extent in this city.†—*Lond. Pharm. Journ., Dec.*, 1863.

ON THE PREPARATION OF BITTER ALMOND WATER.

The preparation of bitter almond water of a uniform strength is a matter of some importance. A number of lamentable accidents, caused by the variation and uncertainty of the strength of this preparation, has caused a useful and agreeable medicine to be almost entirely disused in this country. Many accidents

* It must not be forgotten that oxide of mercury is soluble to a slight extent in potash; but such a solution would not yield a precipitate on boiling, or on the addition of an acid.

† I may mention that "cleaned spirit" is capable of reacting with the mercurial salt in a manner precisely similar to the ordinary "methylated spirit."

have also occurred in France, where it is still largely prescribed, and the preparation of a water of uniform strength has been made the subject of some investigations by MM. Hepp and Schlagdenhauffen.* The experiments of M. Hepp have proved that a water of a constant strength, containing 1 per cent. of Majendie's hydrocyanic acid,† is obtained when from a given weight of bitter almonds an equal weight of water is distilled. Out of fifty-two estimations forty-seven gave exactly 1 per cent. of the acid, or very near to it.

In order to obtain the whole of the hydrocyanic acid which bitter almonds are capable of furnishing, it is important to facilitate the solution of the amygdalin, and submit it to the action of the emulsine under conditions the most favorable to the fermentation. The proportion of water necessary to promote the action of the emulsine on the amygdalin is not less than ten times the weight of the almonds employed. The almonds deprived of their fatty oil must be finely powdered, and allowed to ferment for three days, before the mixture is submitted to distillation. Three days are necessary for the production of the whole of the hydrocyanic acid, and the hydruret of benzule which accompanies it after three days.

M. Schlagdenhauffen has assured himself by experiment that no more hydrocyanic acid is produced, but beyond this lapse of time a period arrives when the amount of acid begins to diminish.

The still employed must be furnished with a false bottom perforated, and should not be more than half filled. The heat must be applied very gradually. Any amygdalin which may have escaped the action of the emulsine during the maceration will now be acted on, and after the distillation it will be found that the residue has been deprived of all bitterness, and will give no more hydrocyanic acid by the addition of an emulsion of sweet almonds.

After ebullition has commenced, the fire may be quickened and the distillation hastened, taking care, however, to cool the worm well, and collect the product in a vessel carefully joined to the end of the worm.

* Reportoire de Chemie Pure et Appliquee, October, 1863, p. 379.

† Majendie's acid, we believe, contains 4 per cent. of real acid.—Ed. C. N.

The work from which the foregoing is quoted contains some statements of much importance. Among other things the author alleges that the amount of hydrocyanic acid is larger when the water is prepared with a hard well water than when distilled water is employed.—*Chem. News*, Nov. 14, 1863.

NOTE ON VEGETABLE IVORY.

By Dr. Phipson, F. C. S., &c.

Vegetable ivory is the fruit of *Phytelephas macrocarpa*, a plant allied to the palm-trees, common in South America. At the period of maturity the grain forms a hard mass resembling ivory or bone, which is manufactured into various kinds of ornaments. According to an analysis by Mulder, its composition may be represented by—

$$C_{12}H_{21}O_{21} = {}_2C_{12}H_{10}O_{10} + HO;$$

Baumhauer obtained a precisely similar result some years later.

I have found that vegetable ivory takes, in contact with concentrated sulphuric acid, a splendid red color, almost equal to magenta. This color, at first pink, then bright red, becomes much deeper and more purple when the acid has been allowed to act for about twelve hours.

This reaction may sometimes be found useful in order to distinguish small pieces of vegetable ivory from the ivory of the elephant's tusk, or from bone, neither of which take this beautiful red color in contact with sulphuric acid.

The analyses quoted above show that the greater portion of vegetable ivory is pure cellulose, but the reaction produced by sulphuric acid proves that other substances are present, for cellulose does not become red with sulphuric acid. Mr. Connel found in 1845 that vegetable ivory contained 81·34 per cent. of cellulose, and that the other substances were gum 6·73, legumine 3·80, albumine 0·42 (that is 4·22 of albuminous substances), oil 0·73, water 9·37, and ash 0·61 = 100. Filings of vegetable ivory dried at 140° to 150° C. give 1 per cent. of ash.

Payen found that these filings when boiled with caustic soda took a yellow color, a fact confirmed by Baumhauer, who asserts that potash does not produce any color.

The reaction of sulphuric acid on vegetable ivory has enabled me more than once to distinguish immediately between filings of this substance, and bone or ivory filings. It is owing to the well-known action of this acid upon albuminous substances in presence of sugar, and which has been utilised by Raspail in his microscopic researches. But whether the sugar is formed by the action of the acid in the cellulose, or pre-exists already formed in the substance is of little import. I incline, however, to the first opinion, as the color takes a little time to show itself (five or ten minutes), and as Mr. Connel did not find any sugar ready formed.

I have since observed that the white portion of the cocoa-nut presents a similar reaction with sulphuric acid; the color produced is first pink, then red, reddish purple, and finally, in about sixteen hours, a fine violet.

The colors thus produced with vegetable ivory and cocoa-nut disappear gradually in contact with water; like the fine reddish-brown color produced with essence of turpentine and sulphuric acid.—*Chem. News*, Nov. 14, 1863.

UPON THE ADMINISTRATION OF BISMUTH IN THE SOLUBLE FORM.

By Charles R. C. Tichborne, F. C. S.

Under the name of Liq. Bismuthi there has been introduced to the notice of the Faculty a preparation, which purports to possess great advantages over the ordinary basic nitrate. The desirable points in this preparation are—first, its solubility; second, its slight taste; and third, its alkalinity. It has also the peculiarity of not being precipitable by water.

I felt the desirability of such a mode of exhibiting bismuth, and therefore made an analysis of the solution for my own information; and as it possesses certain phases of interest, I now take this opportunity of placing it before the members of the Pharmaceutical Society.

A qualitative analysis elicited the following:—The solution contained bismuth, citric acid, and ammonia; not a trace of nitric acid could be detected in the solution. Liq. Bismuthi is therefore probably a solution of a basic salt, having a composition

analogous to $3MOCi + MO$; one of the bases, MO, being replaced by BiO_3: it is made from the recently precipitated and well-washed oxide. From the peculiarity of having to deal with an alkaline bismuthic solution, direct precipitation with sulphide of ammonium was employed to determine the amount of bismuth present; this gave, on washing and drying, 0·327 grammes of BiS_3 in the fluid half-ounce, which represents 1·114 grains of the teroxide as being present in the drachm. Now, although the circular which accompanies the Liq. Bismuthi states that ʒj. is equivalent to a full dose (fifteen to twenty grains) of the insoluble trisnitrate, I do not think that such can be the case. The idea evidently is that the metal, when in the soluble form, is much more active than the ordinary insoluble modification, and there can be no doubt that it is so to a certain extent; but I should consider three grains to the drachm as the minimum dose: even more than this quantity may be easily introduced into such a solution as the above. The following is probably the mode pursued in making this solution:—480 grains of metallic bismuth are dissolved in a sufficient quantity of nitric acid, and this solution of ternitrate of bismuth is then precipitated with ammonia, and the resulting hydrated oxide well washed; 480 grains of citric acid are then exactly neutralized with ammonia, and the moist oxide is gradually added to the boiling solution of citrate of ammonia. The oxide is slowly but perfectly taken up. Ammonia is slightly evolved during the boiling, (probably from the decomposition of the citrate of ammonia *per se*,) but the solution becomes slightly acid, and remains so until the completion of the process. The solution is then neutralized with ammonia, and the whole is made to measure one pint. This solution will contain three grains of BiO_3 to the ʒj. It is more elegantly made by dissolving the citrate of bismuth in citrate of ammonia.*

Tartaric acid has also a similar action upon bismuth.

There seems to be a limit to the solubility of chemically pure citrate of bismuth; but the solubility is wonderfully increased

* Citrate of bismuth is a very insoluble salt, got by the double decomposition of citrate of potash or soda, and ternitrate of bismuth. The citrate, as made in this manner, is extremely soluble in ammonia, or a solution of citrate of ammonia.

by the presence of mineral acids. This is, no doubt, due to the greater solubility of the salts formed by the latter acids in citrate of ammonia.

The reactions of this bismuthic solution are as follows:—

Ammonia and carbonate of ammonia give no precipitate. Potash and soda, or the carbonates of these alkalies, give precipitates insoluble in an excess of the precipitant. Nitric, sulphuric, and hydrochloric acids give precipitates soluble in an excess of the respective acids, and reprecipitable on neutralization with ammonia. These precipitates are also soluble on the further addition of ammonia. Water gives no precipitate. Sulphide of ammonium throws down the whole of the bismuth as sulphide.

As the reactions of citric and tartaric acids are at present little known, it is my intention to investigate the matter further, particularly with a view to its analytical bearing; but in the mean time, I place before you the results of my investigation of the Liq. Bismuthi.—*Lond. Pharm. Jour.*, Jan., 1

Mr. SCHACHT (of Clifton) said that although the author of the paper had not thought fit to mention his name in connection with the liquor bismuthi examined, there could be no doubt, from the quotation made from the circular, that the preparation the meeting had just heard so freely discussed was that made by himself. Assuming this to be the case, he could state that the author had well performed his task in submitting it to analysis. The preparation, sold as liquor bismuthi (Schacht) consisted of bismuth oxide, citric acid, and ammonia, and the quantity of oxide of bismuth present was one grain in each fluid drachm. This, however, had been published in the "Lancet" several months ago. A fact so easy of investigation he had never attempted to keep secret, but, on the contrary, he had told its composition to every medical man with whom he had conversed on the subject. He had adopted the name "Liquor Bismuthi (Schacht)," partly because having been fortunate several years ago in discovering this elegant method of holding bismuth in permanent solution, he was anxious to reap some measure of reward in the credit which would attach to so distinct an improvement as he believed this preparation to be; and

partly also because, as the article can only exist in the form of solution, it was convenient that the profession should be invited to prescribe a medicine of one definite strength. In answer to the author's suggestion that it should be made three times as strong he (Mr. Schacht) had been accustomed to make it, he would observe that the quantity indicated as a dose—one drachm—was easy both to remember and to dispense, and he had abundance of evidence to prove that in such doses it was efficient, in many cases succeeding where full doses of from five to twenty grains of the trisnitrate had failed. He claimed the credit, such as it was, of having been the first to prepare and introduce to the profession a permanently fluid form of bismuth; and as his preparation had been a good deal employed during the last five or six years, it would be a great pity to alter its strength.

Dr. ATTFIELD said that the fact of the solubility of oxide of bismuth in citrate of ammonia had been observed by Mr. Spiller more than five years ago, and published, together with other observations relating to the influence of citric acid on chemical reactions, in the Journal of the Chemical Society. To Mr. Schacht, however, was no doubt due the practical application of this fact, and the production of what was apparently an excellent form of medicine for the administration of bismuth.

Mr. SQUIRE asked Mr. Schacht if any experiments had been made by medical men to determine the relative strengths and values of his preparation and the subnitrate.

Mr. SCHACHT said several cases had been reported to him by Dr. Martin, the senior physician to the Bristol Hospital and other men, in which benefit had resulted from the use of his preparation where the old insoluble form of subnitrate had either failed or proved less efficacious, but he could not at the moment refer to any experiments made with the special object of determining the relative strengths of the two medicines.

Mr. HASELDEN was glad to see Mr. Schacht present to speak for himself. He (Mr. Haselden) had frequently used his liquor bismuthi, and thought it a very elegant preparation. Some persons, on hastily reading the circular that was issued with it, might perhaps have concluded that each fluid drachm contained more than a grain of the oxide of bismuth, as it purported to

represent fifteen or twenty grains of the subnitrate, but it was evident from Mr. Schacht's explanation that this soluble form of bismuth was much more active than the old insoluble form, and hence the much smaller dose proved equally, if not more, efficacious.

Dr. REDWOOD was anxious to say a word or two with reference to the name Mr. Schacht had given to his preparation. Now, that the composition of liquor bismuthi was no longer a secret, he thought it very desirable that a name should be given to it indicating what its composition was. He thought the practice of introducing new medicines under names that afforded no indication, or a very imperfect indication, of what they were, was much to be regretted. Such a practice often caused much inconvenience and difficulty to pharmaceutists in dispensing, and also deprived medical men of the means of ascribing the effects of such medicines to their true causes. He should be glad to know from Mr. Schacht whether he had formed any opinion as to the constitution of the compound of bismuth contained in his liquor bismuthi, and whether he had observed, as stated by Mr. Tichbourne, that ammonia was evolved when the oxide of bismuth was dissolved in the neutral citrate of ammonia. He knew that Mr. Schacht was not unaccustomed to speculations and investigations relating to the constitution of salts.

Mr. SCHACHT remarked that his process not being the same as that described by Mr. Tichbourne, he had not an opportunity of observing the effect referred to on dissolving the oxide in citrate of ammonia. He had, however, found it desirable to add a little excess of ammonia, so as to make the solution alkaline. He had no theory to suggest with reference to the constitution of the salt of bismuth present in the solution.

The PRESIDENT expressed the thanks of the meeting to the author of the paper for his communication, and to Mr. Schacht for the information he had given respecting his very elegant and efficient preparation of bismuth. He quite agreed, however, with Dr. Redwood, that the names given to medicines should, as far as possible, represent their composition.—*Trans. Pharm. Soc., Dec.* 2*d*, 1863.

ON THE ACTION OF OZONE ON ORGANIC SUBSTANCES.

By M. Gorup-Besanez.

In a previous memoir the author has examined the action of ozone on various substances dissolved or held in suspension in water. The products obtained, he finds, are sometimes analogous to those given by the reaction of peroxides at a higher temperature on the same substances.

This is not, however, generally the case, and certain bodies which are easily oxidized by peroxides entirely resist the action of ozone.

The experiments set forth by the author seem to him to show a remarkable coincidence between the mode of action of ozone, and that of the animal organism considered as an oxidizing agent.

The author at first completed his experiments on the action of ozone on certain substances in the absence of alkalies. To the bodies unattacked by ozone he adds unnitrogenized organic acids, such as acetic, butyric, palmitic, lactic, oxalic, tartaric, malic, and citric acids, also mannite, glycerine, and oleine. To the bodies which undergo transformation he has added tyrosine, which furnishes a brown matter analogous to M. Stædeler's erythrosine.

He then studied the influence of free alkalies, or carbonates on the oxidation of organic matters by ozone. He found that the presence of alkalies favors this oxidation, and sometimes changes the nature of the products formed.

Uric Acid.—A watery solution of pure uric acid, with the addition of a few drops of potash, absorbs the ozone in the same way as in the absence of potash, only that there is a continuous disengagement of ammonia. Urea and oxalic acid are found in the liquid, but no allantoine, which is formed with uric acid and ozone without alkali.

Urea quickly absorbs ozone; ammonia is disengaged in presence of potash. When the absorption is completed, the liquid contains only carbonate of potash. Urea is not decomposable by ozone without alkalies.

Leucin.—At the beginning of the reaction a slight disengagement of ammonia takes place, which soon ceases, leaving

the odor of valeric aldehyde. If at this moment a little of the liquid is supersaturated by an acid, the odor of cyanic acid will be perceived. After a time the addition of an acid causes the disengagement of carbonic acid only. By distilling the liquid first alone, and then with the addition of phosphoric acid, the presence of butyric acid and of other fatty volatile acids may be shown.

Grape sugar is not attacked by ozone, but in presence of soda, potash, or carbonate of soda, it is entirely transformed into carbonic and formic acids.

Cane sugar oxidizes much more slowly than grape sugar, but the same products are formed.

Glycerin at first gives a faint odor of acrolein. The liquid becomes gradually acid, and by the addition of another small quantity of alkali the reaction is sustained, and carbonate, formiate, and propionate of potash are obtained.

Olein absorbs ozone in presence of alkalies. Glycerin is first attacked, and furnishes acroleine and fatty volatile acids, while oleic and palmitic acids, set at liberty, combine with potash, and are then only slowly burnt. The reaction is the same if the caustic alkalies are replaced by carbonate of soda. This reaction is of some importance, as possibly explaining the decomposition of fatty matters in the blood.

Fatty Volatile Acids $(CH)nO_4$.—The only acids which resist the oxidizing action of ozone are simply burnt slowly and continuously in the presence of alkalies. On the completion of the reaction, only formic and carbonic acids are found in the liquid.

Solid fatty acids, such as palmitic and stearic acids, are attacked very slowly, even in presence of an excess of alkali. Carbonic acid is formed immediately, but no fatty acid containing a less number of carbon equivalents.

Benzoic and succinic acids yield only carbonic acid, but they are burnt much more rapidly than the fatty acids.

Oxalic acid is also transformed into carbonic acid, but very slowly.

Citric acid, in presence of an alkaline solution, rapidly takes up ozone, the products of the reaction being oxalic and carbonic acids.

Hippuric acid has not given very precise results; carbonic

and formic acids were detected in the products. Nitrogen is not eliminated as ammonia; but the author has not found any nitrogenised product in the liquid.

Purified *bile*, that is to say the mixture of glycocholate and taurocholate of soda obtained by evaporating fresh ox bile, treating the residue by absolute alcohol, and decolorising the solution by animal charcoal, evaporating, recovering by water, and shaking the watery solution with ether so long as it takes up anything. Bile thus purified rapidly absorbs large qantities of ozone. At whatever stage of reaction the liquor is examined, there will be found in it, besides the undecomposed acids, only carbonic and sulphuric acids. This is another instance in which the author has been unable to decide under what form the nitrogen is eliminated.

Salicin.—After a few days the liquor becomes acid, when a few drops of alkali are added the action of the ozone continued until it was exhausted. No salicylic acid is to be found in the liquid, but only carbonic acid.

Gelatin is entirely transformed into a body with altogether different properties, not being in the form of jelly, and precipitating neither by tannic acid nor by bichloride of mercury, but only by alum, sulphate of copper, and mercurial nitrate.

Albumen, after the addition of a few drops of potash, behaves with respect to ozone the same as without this addition; it furnishes a body analogous to the peptones.

The author concludes by enforcing the analogy which seems to him to exist between these reactions and the combustion taking place in the animal organism.—*Lon. Chem. News*, Nov. 7, 1863, from *Annalen der Chemie und Parmacie*, cxxv., 207.

ON INDIUM.

By F. Reich and Th. Richter.

Imperfect as our researches on the properties of the new metal and its compounds must be, in consequence of the very small amount we have been able to obtain, we think it advisable to make known what we have discovered, as we see no prospect of procuring a larger quantity.

The situation of the bright blue we observed in the spectro-

scope is at 98 on the scale, and the paler at 135, that is when the sodium line is placed at 50 and the strontium line at 93. When the sodium line is 50 and the strontium 104, indium α will be 110, and indium β will stand at 147. Indium also gives a violet color when one of its salts is introduced into the flame of a Bunsen's jet, so that its presence can be recognised without the spectroscope.

The oxide, when reduced before the blow-pipe on charcoal, gives a white ductile metal resembling tin, but which marks paper clearer than lead. The metal dissolves in hydrochloric acid with some evolution of gas, and a platinum wire, moistened with the solution, shows a very intense blue line, which, however, is very evanescent.

The metal is easily fusible before the blow-pipe, and gives a residue which is a dark-yellow while hot, and pale straw-yellow when cold ; this residue is driven off with difficulty by the reduction flame, to which, in volatilising, it communicates a peculiar violet tinge.

The ignited oxide is always obtained yellowish, which is probably caused by a trace of iron oxide.

The hydrated oxide precipitated by ammonia is always white and slimy, so that it adheres to the side of the beaker. Tartaric acid added to a solution of the oxide prevents its precipitation by ammonia ; sulphide of ammonium added to the mixture causes a bulky white precipitate, colored pale greenish by a trace of iron.

Potash precipitates the hydrated oxide from acid solutions as perfectly as ammonia.

Carbonate of soda throws down a more crystalline precipitate, and the white deposit so obtained at a boiling heat, after drying, easily dissolves in dilute sulphuric acid with effervescence, showing that it is a carbonate of indium oxide.

The ignited oxide, heated to redness in a stream of dry hydrogen, forms no water and undergoes no change.

When mixed with charcoal, and heated to redness in a tube in a current of chlorine, it forms a volatile chloride, which condenses at the cold end of the tube. The chloride has a yellow color, probably from a trace of iron ; but single crystalline scales are seen, which appear colorless, and have a mother-of-pearl lustre.

The chloride is very deliquescent, and when dried again it partially decomposes.

The chloride shows the blue line with the greatest brilliancy, but, owing to its volatility, the line quickly disappears. If, however, some oxide is placed on a platinum spoon, and moistened with hydrochloric acid, the appearance of the blue line in the spectroscope is less brilliant, but more lasting, and by moistening afresh with the acid, the experiment may be repeated several times without renewing the oxide.

The solution of the reduced metal in hydrochloric acid, gave, with ammonia and sulphide of ammonium, a greyish brown precipitate; and further experiments were necessary to decide whether this color really belonged to the sulphide of indium or was caused by some impurities.

The purification of the oxide by successive treatment of the first solution with sulphuretted hydrogen, precipitation by ammonia, redissolving, and again precipitating by potash, gave the before-mentioned results. It remained to separate the iron. By the decomposition of the acid solution with excess of acetate of soda, and heating, the oxide of iron was thrown down, and the liquid still contained a good deal of oxide of indium, but a part of the latter went down with the oxide of iron.

It is best to precipitate the iron by the cautious addition of bicarbonate of soda. On boiling the filtrate, and adding a small quantity of soda salt, the oxide of indium is precipitated either as hydrate or carbonate.

The solution of the chloride obtained in the way before mentioned gave, with ferrocyanide of potassium, a white precipitate, colored bluish by a trace of iron. With ferridcyanide it gave no precipitate.

As oxide of indium bears much resemblance to thorina—from which, however, it may be distinguished by its insolubility in potash, and reducibility on charcoal—it may be mentioned that when moistened with cobalt solution and heated, it does not become blue, and ignited in hydrochloric acid it slowly, but perfectly dissolves. On adding a sulphate solution to a solution of sulphate of potash and evaporating, no alum crystals were obtained.

We have yet to discover in what minerals indium occurs. On

passing chlorine gas over pieces of zinc blende, arsenical pyrites, and sulphur pyrites, we only obtained indium from the blende. Chloride of indium sublimed in the tube, but some remained behind with the chloride of zinc.

We have found indium in zinc distilled from Friburg ore, and have separated the oxide. A very large quantity of ammonia is requisite to obtain 0·1 per cent. of the oxide from the dissolved zinc, and this small quantity must be purified in the manner before described.—*Chem. News, London, Dec,* 12, 1863. from *Journal für Prakt. Chemie.*

ON MAUVE, OR ANILINE PURPLE.

By W. H. Perkins, F. C. S.*

The discovery of this coloring matter in 1856, and its introduction as a commercial article, have originated that remarkable series of compounds known as coal-tar colors, which have now become so numerous, and, in consequence of their adaptability to the arts and manufactures, are of such great and increasing importance. The chemistry of mauve may appear to have been rather neglected, its composition not having been established, although it has formed the subject of several papers by Continental chemists. Its chemical nature also has not been generally understood, and it is to this fact that many of the discrepancies between the results of the different experimentalists who have worked on this subject are to be attributed.

On adding a solution of hydrate of potassium to a boiling solution of commercial crystallised mauve, it immediately changes in color from purple to a blue violet, and, on standing, deposits a crystalline body, which, after being washed with alcohol and then with water, presents itself as a nearly black glistening body, not unlike pulverized specular iron ore.

This substance is a base which I propose to call *mauveine;* it dissolves in alcohol, forming a violet solution, which immediately assumes a purple color on the addition of acids. It is insoluble, or nearly so, in ether and benzol. It is also a very stable body, and decomposes ammoniacal salts readily. When heated strongly

* From the *Proceedings* of the Royal Society.

it decomposes, yielding a basic oil. Its analysis has led to the formula C_{27}*$H_{24}N_4$.

Hydrochlorate of Mauveine.—This salt is prepared by the direct combination of mauveine with hydrochloric acid. From its boiling alcoholic solution it is deposited in small prisms, sometimes arranged in tufts, possessing a brilliant green metallic lustre.

It is moderately soluble in alcohol. Carbon, hydrogen, nitrogen, and chlorine determinations have led to the formula $C_{27}H_{24}N_4HCl$.

I have endeavored to obtain a second hydrochlorate, but up to the present time have not succeeded.

Platinum Salt.—Mauveine forms a perfectly definite and beautifully crystalline compound with bichloride of platinum, which, if prepared with warm solutions, separates in the form of crystals of considerable dimensions. It posseses the green metallic lustre of the hydrochlorate, but, on being dried, assumes a more golden color. It is very sparingly soluble in alcohol. The analysis of this salt has led to the following formula:—

$$C_{27}H_{24}N_4,HPtCl_3.$$

Gold Salt.—This substance separates as a crystalline precipitate, which, when moist, presents a much less brilliant aspect than the platinum derivative; it is also more soluble in alcohol than that salt, and when re-crystallized appears to lose a small quantity of gold. Its analysis has given numbers agreeing with the formula—$C_{27}H_{24}N_4,HAuCl_4$.

Hydrobromate of Mauveine.—This salt is prepared in a similar manner to the hydrochlorate, which it very much resembles, except that it is less soluble. Carbon, hydrogen, and bromine determinations give results agreeing with the formula—

$$C_{27}H_{24}N_4HBr.$$

Hydriodate of Mauveine.—In preparing this salt from the base, it is necessary to use hydriodic acid, which is colorless, otherwise the iodine will slowly act upon the new product. It crystallizes in prisms, having a green metallic lustre. It is more

* C = 12.

insoluble than the hydrobromate. Its analysis has led to the formula $C_{27}H_{24}N_4,HI$.

Acetate of Mauveine.—This salt is best obtained by dissolving the base in boiling alcohol and acetic acid. It is a beautiful salt, crystallizing in prisms possessing the green metallic lustre common to most of the salts of mauveine. Combinations of this substance gave numbers agreeing with the formula—

$$C_{24}H_{24}N_4,C_2H_4O_2.$$

Carbonate of Mauveine.—The tendency of mauveine to combine with carbonic acid is rather remarkable. If a quantity of its alcoholic solution be thrown up into a tube containing carbonic acid over mercury, the carbonic acid will be quickly absorbed. To prepare the carbonate it is necessary to pass carbonic acid gas through boiling alcohol containing a quantity of mauveine in suspension; it is then filtered quickly, and carbonic acid passed through the filtrate until cold; on standing the carbonate will be deposited as prisms having a green metallic lustre. This salt, on being dried, gradually loses carbonic acid. From experiments that have been made with this salt, it would appear to have the composition of an acid carbonate,—viz: $C_{27}H_{24}N_4H_2CO_3$.

In the analysis of salts of mauveine great care has to be taken in drying them thoroughly, as most of them are highly hygroscopic.

I am now engaged with the study of the replaceable hydrogen in mauveine, which I hope will throw some light upon its constitution. From its formula I believe it to be a tetramine, although up to the present I have not obtained any definite salts with more than one equivalent of acid. Mauveine, when heated with aniline, produces a blue coloring matter, which is now under investigation. A salt of mauveine, when heated alone, also produces a violet or blue compound.—*Chem. News, Lond.*, Nov. 21, 1863.

A NEW ALKALOID FOUND IN ACONITUM NAPELLUS; DESCRIPTION AND MODE OF PREPARATION.

By Messrs. T. and H. Smith.

In lately separating aconitina from *Aconitum Napellus*, a crystalline substance, new to us, presented itself, and on closer

examination we found it to be possessed of alkaline properties. This circumstance interested us much; and not knowing of any like substance having been mentioned by any one who had examined *Aconitum Napellus*, we have thought a short statement of its characteristics, so far as they have yet been ascertained by us, might be acceptable to your readers.

Two characters of the substance render its separation exceedingly simple and easy,—these are, its almost absolute insolubility in neutral watery liquids, and its great solubility in excess of acid.

The juice of aconite-root having been evaporated to a soft extract, is exhausted with spirit of wine, and the spirit having been distilled off, the remainder is brought to an extract, which is also submitted to the action of spirit of wine, to be exhausted.

The spiritous liquid is now mixed up with milk of lime, using 1½ lb. for every cwt. of the fresh root. After filtration sulphuric acid is added, till there is no further precipitate. The spiritous solution being now filtered, is submitted to distillation for the recovery of the spirit. The watery portion left, after the separation of an abundant, dark-green, fatty matter, is filtered.

The liquid is now in a state for obtaining the new alkaloid. The liquid will be found strongly acid, and it is in virtue of this strong acid state that the substance in question is kept in solution, for it separates as soon as the acid is neutralized. A strong solution of carbonate of soda is therefore now added, at first very freely, as strong effervescence on the addition of more soda shows unmistakably the existence of excess of acid. Towards the end, however, the addition of the alkali must be more carefully made, and at considerable intervals; at the same time taking care to stir repeatedly and briskly. When the fluid has been brought to a nearly neutral state, but still slightly acid, it is to be left to itself for a day or two. None of the aconitina can be thrown down till the liquid becomes alkaline.

The next step to be taken is to filter the liquid from the abundant preciptate, which separates partly as a loose powder, and partly as a crystalline deposit on the sides of the precipitating

vessel. This precipitate gives the new body observed by us, and, so far as we are aware, for the first time now described. We propose to name it Aconella.

It is easily obtained pure in snow-white crystalline tufts, by repeated crystallization from boiling spirit, with the aid of a little pure animal charcoal; for although it is very sparingly soluble in cold spirit, it has considerable solubility in boiling spirit, from which it readily crystallizes almost entirely on cooling.

Aconella is very insoluble in water, so much so that if a fraction of a grain be dissolved in a few ounces of water weakly acidulated, the clear liquid, on the addition of an excess of ammonia, becomes quite milky. It is soluble in 1·14 parts by measure of boiling rectified spirit (density ·840), but on cooling only about $\frac{1}{300}$ part is retained in solution.

It is moderately soluble in sulphuric ether, much more so in acetic ether, and quite remarkably so in chloroform,—comparable to camphor in this liquid, or powdered sugar in water.

It burns entirely away on platinum foil. When heated with soda lime, abundance of ammoniacal vapor is given off.

Aconella is precipitated from watery solutions by tincture of iodine.

Tannin does not precipitate the muriate, but the oxalate is precipitated by it. Corrosive sublimate precipitates aconella, as do also the terchloride of gold and the chloride of platinum.

One remarkable character belonging to it is its great tendency to crystallize, equalling, perhaps, in this respect even cantharidin itself, and thus permitting of its being confounded with but very few other bodies.

It will be unnecessary to give more than one very striking example to prove this. On evaporating two ounces of a cold saturated spiritous solution containing about three grains of the alkaloid to dryness, in a flat Berlin dish, and at a heat of about 120° Fahr.; instead of drying up, as might have been anticipated, in an amorphous state, every particle of the substance showed itself in a beautiful crystalline condition, white shining needles covering the whole bottom of the dish.

Although insoluble in water, it is very soluble in all the acids

we have yet tried; and although these solutions be made in the presence of a large excess of the base, they invariably redden litmus; still, although such be the case, aconella, weakly however, turns reddened litmus-paper blue; for if a faintly reddened piece of litmus-paper be put into a boiling-hot spiritous solution, the blue color of the test-paper slowly but unmistakably returns. Readily crystallizable as the alkaloid itself is, we have not yet succeeded in getting any of its salts to crystallize, with the exception of the muriate; and even this salt crystallizes but slowly. If, however, the pure alkaloid be dissolved in spirit by the aid of muriatic acid in a glass beaker, and the beaker be then set aside uncovered, at the ordinary temperature, in the course of a few days at about an inch from the surface of the liquid, a broad ring of most beautifully delicate radiated crystals make their appearance; and in some days more the now comparatively watery liquid sets into a mass of snow-white, foggy tufts, arranged round the bottom of the beaker in amphitheatre-like form, so as to leave the glass at the centre of the bottom quite clear and bright.

From the following additional proofs in connection with what has been already stated, there cannot, we think, be any doubt that the new substance must be classed among the natural organic alkalies.

Aconella does not appear to have any poisonous quality. We gave three decigrammes to a cat, without the production of any apparent inconvenience to the animal.

Its harmless character naturally suggests the question whether the admittedly weak action of most of the aconitina of commerce may not arise from its mixture with aconella. Putting aside the idea of intentional adulteration, its inferior potency could very well be accounted for by the presence of this substance, without involving any imputation of blame, and only indicating ignorance of the means to be adopted for securing the purity of the aconitina.

As both aconitina and aconella are precipitated by alkalies, it is very probable that this mixed precipitate has been accepted by some operators as pure aconitina. In the process of purifica-

tion, unless a quantity of acid be used not greater than is necessary to redissolve only the aconitina, both will be redissolved, and at the next precipitation they will go down together as before.

If the aconella has not already been removed in the preparation of aconitina, its presence can be prevented by carefully avoiding more than the faintest acid reaction in redissolving the aconitina.

Aconitina is a strong alkaloid, and therefore at once turns reddened litmus blue; on the contrary, all the solutions of aconella in acids, strongly redden litmus; therefore after redissolving the precipitate of aconitina, mixed with aconella in acids, the liquid should show, after sufficient time and agitation, only a slight acid reaction, else the aconitina when again precipitated will be mixed to a more or less extent with aconella. Even the use of ether will not secure the absence of aconella, because although aconitina is very soluble in ether, aconella is not by any means insoluble in that liquid.

Another probable cause of the deterioration of aconitina when mixed with aconella may be the absorption of the aconitina by the charcoal used in bleaching it. Charcoal has so remarkable an attraction for aconitina, that we have often seen it entirely absorbed by the charcoal; so that in purifying a mixture of aconitina and aconella, it might very readily happen, that the substance ultimately obtained would not contain a trace of aconitina.

The quantity of aconitina given by 1 cwt. of the fresh roots, never, so far as our experience goes, exceeds 1 oz. A simple calculation founded on the comparative strength of the aconite-root and pure aconitina, perhaps the most potent of all poisons, will show that no possible means could yield much more than that quantity.

The crystallization of a hot spiritous solution of aconella in gaslight presents a very remarkable and beautiful appearance. The whole body of the liquid seems to be incessantly emitting minute flashes of light, something like what might be expected from a shower of minute particles of incandescent lime—a sort

of deflagration, but in a liquid medium. The phenomenon seems to be caused by the reflection of the light from the faces of crystals, continually forming and moving in the liquid, as they present to the incident rays the proper angle of reflection to the eye of the observer.

It is a very remarkable fact, that the characters of aconella bear a great resemblance to those of narcotina. The similarity is so great that we have compared them together to a certain extent, and although the comparison has not yet been carried out to produce the conviction of absolute identity, yet so far as it goes, it leads to the belief, that aconella is nothing else than narcotina. We may carry out the comparison and give the results; but in the meantime we will give the points of resemblance ascertained betwixt the two alkaloids.

Aconella is without taste in the solid state, so also is narcotina; the solutions of both however are very bitter.

Aconella is a very weak alkali, very soluble in acids, and the solutions are all strongly acid; the same remarks apply to narcotina.

Tincture of iodine precipitates aconella, it also precipitates narcotina.

Tannin precipitates aconella from an oxalic acid solution, but not from one in muriatic acid, characters also common to narcotina.

Aconella is remarkably soluble in chloroform, and the solution, spontaneously evaporated, presents a peculiar appearance; the very same peculiarity of appearance is shown with narcotina. The crystallizations of the two alkaloids from spirit are also exact counterparts of each other. They are both insoluble in caustic alkalies. On adding strong sulphuric acid to narcotine, hardly any color is produced, but on the addition of a minute particle of nitre a deep blood-red color is at once displayed; aconella answers in exactly the same way to this test. A specific-gravity bottle filled with a boiling-hot spiritous saturated solution of aconella—density of spirit ·840—was found, after deducting weight of bottle, to weigh 9·53 grammes. The weight of the crystalline solid after evaporation

was 0·89 gramme. Consequently 1 part of aconella dissolves in 9·6 parts by weight of boiling spirit, or 11·4 by measure.

The same experiment was made with narcotina, and it will be observed that the two bodies give the same solubility almost to a nicety. The narcotina and spirit in specific-gravity bottle weighed 9·55 grammes. The weight of crystallized narcotina was 0·90 gramme. The equivalent of aconella determined by calculations from data obtained by experiment is almost exactly that of narcotina.

	Grammes.	Platinum obtained. Grammes.		Percentage of Platinum.	Average of Platinum
Weight of chloride of platinum and aconella manipulated upon.	3·065	0·465	=	15	15·66
	0·500	0·075	=	15	
	0·500	0·085	=	17	

Aver. of Pt. Comp. Pt.

Therefore 15·66 : 100 :: 99 : x = equiv. of compound. x = 632·18

We thus obtain 632·18 as the equivalent of the double chloride.

As three equivalents of chlorine, one of platinum, and one of aconella make up the compound, the equivalent of aconella alone is obtained by deducting from the whole the chlorine and platinum.

$$\overset{\text{Cl.}}{35{\cdot}5} + 3 = 106{\cdot}5 + \overset{\text{Pt.}}{99} = 205{\cdot}5$$

Deducting this sum from 632·18, we have 426·68 left as the equivalent of aconella.

Narcotina, $C_{46}H_{25}NO_{14}$, has as its equivalent 427, a number so close to the calculated equivalent of aconella, that it seems to change to reality the supposition of these two alkaloids being one and the same, though obtained from plants belonging to different Natural Orders.—*Lond. Pharm. Jour., Jan.*, 1863.

Edinburgh, 18th December, 1863.

Minutes of the Philadelphia College of Pharmacy.

A Special Meeting of the College was held at the Hall, 2d mo., 5, 1864. The President in the chair.

The meeting was informed of the sudden death of Dr. Robert P. Thomas, a member of the College, and Professor in the School of Pharmacy.

The following Resolutions, prepared by the Secretary, were now read and, on motion, unanimously adopted, and directed to be published:—

The College, having heard with deep sorrow of the sudden removal by death of our late fellow-member, Dr. Robert P. Thomas, Professor of Materia Medica in the School of Pharmacy; therefore,

Resolved, That the connection of Dr. Thomas with this College has been such as to secure the esteem and regard of all connected with it. His loss will be especially felt by the numerous graduates and students of the School, who, while profiting by his instructions, have learned to respect and esteem him. By the members of the Board of Trustees and of the College at large, he will be lamented as a talented and warm-hearted associate, cut off in the midst of a career of usefulness and promise.

Resolved, That the members of the College will attend his funeral at the time and place appointed; that the appropriate Committee be directed to prepare a suitable memorial of Dr. Thomas, to be read at the approaching Annual Meeting, and published in the Journal, and that a copy of these Resolutions be furnished his family, with an expression of our sympathy for them in their bereavement.

On motion, the College adjourned.

Edward Parrish, *Secretary.*

Resolutions of the Zeta Phi Society.

At a regular meeting of the "Zeta Phi Society of the Philadelphia College of Pharmacy," held February 5th, 1864, the following preamble and resolutions were adopted:

Whereas, It has pleased an All-wise Providence to remove from among us our worthy and esteemed Professor, Dr. Robert P. Thomas, who has so long filled the chair of Materia Medica in this College; therefore,

Resolved, That we, as members of the "Zeta Phi Society of the Philadelphia College of Pharmacy, tender to the afflicted family of Dr. R. P. Thomas our heartfelt sympathy in their irreparable loss.

Resolved, That we sympathize with the Board of Trustees and the College at large, in the loss of so talented and warm-hearted a fellow-

member, cut off suddenly as he has been in the midst of his usefulness and growing reputation.

Resolved, That the members of this Society, who have listened to his clear and lucid instructions, and have felt the influence of his calm and courteous demeanor, will ever cherish the remembrance of his virtues, and we trust will be influenced by his example throughout our lives.

Resolved, That this preamble and resolutions be entered on the minutes of this Society; that a copy be forwarded to the family of the deceased, and another to the Trustees of the College.

Signed on behalf of said Society by the Committee.

ALBERT E. EBERT,
EDWARD C. JONES, } Committee.
H. C. CROFT,

Editorial Department.

THE BRITISH PHARMACOPŒIA has at last made its appearance in England, and a few copies have reached the United States, but we have not yet seen it. The February number of the Pharmaceutical Journal gives a view of some of its leading features, some of which it decidedly disapproves of. In the *first* place, the work is in English, the outside pressure in favor of the vernacular having overcome, very properly, the influence of the London College of Physicians. *Secondly*, the only divisions of weights known in the work, are the avoirdupois pound and ounce, and the troy grain. The measures are the imperial gallon and its divisions. In both weights and measures, the old symbols are entirely abandoned; Those for weights being lb. oz. and gr., and for measures, "fl. oz." for fluidounce, and "fl. dr." for fluidrachm. In *Nomenclature* many changes have been made, several of which are adoptions of our own names, as Hydrargyri Oxidum Rubrum, Hydrargyri Iodidum Viride, Chloroformum, Quiniæ Sulphas, Aconitia, etc.

Chemical Notation to express the composition of the chemicals has been adopted. Thus Nitric Acid is represented as $3HO, 2NO_5$.

The list of preparations omitted is very extensive, including 6 vinegars, 13 decoctions, 5 confections, 6 extracts, 5 infusions, 7 liquors, 6 pills, 10 spirits, 10 syrups, 12 tinctures, 9 troches, 7 ointments, and 4 wines.

We hope to have an early opportunity to examine its processes, and extract such as may be novel and interesting to our readers.

INTERNAL REVENUE DECISION.—Mr. E. Fougera, of New York, writes us in reference to a recent letter from the Department of Internal Revenue. Mr. F. queried whether certain preparations which he makes, and

the formulæ of which have been published in the medical and pharmaceutical journals, are subject to stamp duty,—labels having been submitted with the letter,—calling them "Fougera's Dragées," etc., and whether if stated "Dragées, etc., made by E. Fougera," they would be free from stamp duty. The following is the letter from the Deputy Commissioner;

OFFICIAL.

[*Treasury Department, Office of Internal Revenue.*

WASHINGTON, February 6th, 1864.

SIR:—In reply to yours of the 23d ult., enclosing labels of sundry medicinal preparations, I have to say, that every preparation which is recommended as a remedy for any disease is subject to stamp duty, unless its full and proper formula is published in one of the text-books, or journals specified in section 107 of the Excise law, and the article is offered for sale under the same name, form and guise as those under which it is laid down in such text-book or journal.

The several imported articles to which you refer,—"Sulfate de Quinine de Robiquet," "Dragées de Proto-Iodure de fere de Gille," "Pilules de Blancard," "Ergotine de Bonjean," "Pastilles de lactate de fer de Gelis et Conté" and "Pilules Purgatives,"—are laid down under those names in the medical text-books, and therefore exempt from stamp duty.

If the formulas of the other preparations have been published with the names borne upon the labels submitted, I am without information of the fact. I cannot therefore give a more explicit answer as to their liability or exemption. Very respectfully,

EDWARD A. ROLLINS,
Deputy Commissioner.

E. FOUGERA, Esq.,
30 N. William St., N. York City, N. Y.

Proceedings of the American Pharmaceutical Association at its eleventh Annual Meeting, held in Baltimore, Md., September, 1863. Also the Constitution and Roll of Members. Philad. 1863. pp. 321, octavo.

After more than usual delay the Proceedings for 1863 were published about the end of January, 1864, the result of various interfering circumstances only to be appreciated fully by those who have had such labor as it involves, to perform. As usual the first chapter is devoted to the Minutes of the meeting, which is much the same as that presented to our readers in November. Then follows the Report on Pharmacy, by Prof. Mayer, of New York. This document occupies 123 printed pages, and with slight alterations is arranged like that of Prof. Maisch, for 1862. The addition to Pharmaceutical and Chemical literature since last report, first claims notice followed by the usual record of observations and discoveries in Pharmacy and Materia Medica, (arranged according to the natural order.) This portion is an extensive reference to papers that have appeared in the principal Pharmaceutical and Chemical Journals of Europe

and the United States. This chapter will be found to be particularly useful to investigators, giving, as it does, a bird's eye view of the accumulated labors of the past year. The remainder of the report is chiefly devoted to a record of the progress of Chemistry, inorganic and organic, so far as to note the papers and authorities, accompanied, in many instances, by short comments.

Dr. E. R. Squibb's Report on the Drug Market, follows, and is a new feature—being a replacement of the report on adulterated drugs in former Proceedings. This committee was appointed "To report annually the fluctuations in the supply and demand of drugs; the variations in quality; and adulterations and sophistications coming under their observation, or reported to them by others; and that they be authorized to make report on any adulterations and sophistications of immediate interest, through the Pharmaceutical Journals as soon as practicable after their discovery; and that all members are requested to furnish information of the kind required, to the Chairman, without unnecessary delay." The extent of this report will not admit of its publication here, but we give a few extracts to convey an idea of its character, and refer our readers to the Proceedings. The remarks on drugs apply chiefly to the New York market.

"*Aloes.* During a large proportion of the past year the better grades of aloes, namely, those prepared by exposing the juices of the plant to the sun and air only, in drying, have been very scarce and high, sometimes altogether absent from the market. The best varieties of the so-called socotrine aloes, characterized by a ruby-red color and fragrant aromatic odor, were very rarely to be had during the year, and the price even for lower grades, instead of 42 to 46 c., has been 65 to 85 c., and this without much variation either in the supply or price in foreign markets. With all this, the quality has been low and very variable, leading to the inference, not alone indicated by this article, that, particularly in these times, anything is good enough for the American markets. The inferior grades of aloes, known as Cape, Curaçoa, Bonaire, Barbadoes, and Hepatic, have varied much less from the usual prices, and, except the Barbadoes variety, have been abundant. Cape at 23 to 26 c., Curaçoa at 40 to 50 c.; Bonaire at 42 to 46 c.; and Hepatic at 60 to 70 c. Probably from an unusual demand for veterinary purposes, Barbadoes Aloes has been very scarce and occasionally absent.

Three varieties of Aloes are now officinal in the new Pharmacopœia under the names of Barbadensis, Capensis, and Socotrina, the definition of each, except the Cape variety, being based upon the species of the plant which is supposed to furnish it. The real practical difference, however, probably depends more upon the mode of preparation; and the names are to be regarded more as conventional indices of quality, than as evidences of the sources, either botanical or geographical, from whence the grades are obtained.

Belladonna. This article, though neither scarce nor high in price at any time within the past year, has been so uniformly bad in quality, that there has been great difficulty in getting any fit for use. Bales upon bales of it, of variegated dull colors, (excepting green,) musty or nearly odorless, containing various other plants, and in two instances, at least, a notable proportion of digitalis, could at all times be found, at prices

from 22 to 30 c. per pound. From the frequently torn and rotten condition of the bales it might be inferred that the general stock was old, as well as otherwise bad, and yet this article must have been largely used within the past year for tinctures.

Camphor. This drug has been very high and somewhat variable in price, but of uniform quality and always in abundance. Next after sulphate of quinia and opium, this article is probably most subject to speculative variations in price and demand, whilst from its nature and properties as a concrete volatile oil, it is, of all drugs, perhaps the least susceptible to variations in quality, or to sophistication.

Cardamom. The short, heavy, plump capsule, with round, full, oily seed, and fine aromatic odor,—that is the true, unmixed Malabar cardamom, was only rarely to be found during the past year; while the long shrivelled capsule, with few, light-colored, flattened spongy seeds, of a dull, somewhat terebinthinate odor and taste, seemed to have taken possession of the market, and at prices which for the better variety, would have hitherto been fabulous. The occasional parcels of the better variety commanded prices such as $3.00 and 3.50 per pound, whilst the inferior qualities have been generally quoted at $2.00 to 2.75.

Cinchona. True Calisaya Bark, or Yellow Cinchona, has been in about the usual quantities, at prices from $1.65 to 1 85 per pound, and always easily accessible to the few who seek it. Like other articles of small demand, it has maintained a pretty even market, chiefly from being without the pale of speculation, and because its inferior representatives of the Cinchonas, are almost universally taken by pharmaceutists. Soon after the East Side or New Granadian barks took the place of this, in the manufacture of Sulphate of Quinia, they also appear to have been generally substituted in pharmacy, so that instead of a cinchona containing 2 to 3 per cent. of alkaloids, pharmaceutical preparations of the present day, are made from those which contain the half of one per cent., and cost from 15 to 70 c. per pound.

Red Bark, or Red Cinchona, is still less used, and has fewer substitutes. It is always to be had of excellent quality, at prices varying from $1.55 to 1.70 per pound.

Colchicum Root and Seed have been unusually scarce and high, and the root rarely of good quality. The ordinary market stock of the root has varied little in price, being usually sold at 20 to 24 c. But the more important seed has always been very high and variable in price, rarely below 60, and sometimes as high as 80 c. for fair parcels. The large, round, plump, brown, and bitter seed, commonly known as English Colchicum seed, has been almost entirely absent during the year, and the most careful buyers have generally been obliged to take the cleaner and better parcels of the black or German seed; and it is doubtful whether this variety, when well selected, is not as good as the first named.

Ipecacuanha. This drug, without material variation in quality, has been extremely high in price, and often very scarce. In February it was sold as high as $3.50 per pound, and has at no time fallen below $3.00. Some lots have appeared in the market during the year, that were damaged. In some cases the damaged portions are found throughout the ceroon. From having been put up in this condition, or in such a state as to assume this condition, it is designated in the market as "country damaged." Another condition also occasionally met with, wherein the damaged portions are upon the outside only, is known as "ship damaged." When the damage is slight, these conditions are rarely seen or recognized, except to obtain indemnity from foreign shippers or insurance companies, or to cheapen the market for sharp, close buyers. The above remarks

apply only to what is known as Rio Ipecac., or Ipecac., from Rio Janeiro. The inferior Carthagena Ipecac. has been generally quoted at $2.40 to 2.62.

Jalap. This drug has also been sold at enormous prices throughout the year. From 90 c. per pound, it had by November, 1862, reached $2.00, and is now not to be had of fair average quality, short of $1.90. Although scarce, and not in large supply, there has been no time when good parcels could not be had at the prices asked; for, as is often the case, when prices are very high, the highest grades are of slowest sale, and rarely wanted. The Jalap of the last two years appears to contain more very small fusiform tubers, (not false or fusiform Jalap,) and more very large ones, so that it is less uniform or has the uniform portions selected for better markets.

Opium. The market for this drug has not been behind that of any other in the number and suddenness of its fluctuations. Always a favorite drug for speculation and investment, and like sulphate of quinia and camphor, always liable to run out into channels of speculation, among persons who have no knowledge of the article or the market, it easily becomes a leading bubble, to be inflated or compressed by each steamer's news of short crop, diminished stock, vigor of demand, difficulties of exchange, etc. Under ordinary circumstances, Smyrna Opium, of fair quality, is the only kind which reaches this market, and the stock in Boston, New York, and Philadelphia, is usually said to average 200 cases. Since the indiscriminate sale of prize goods from captured vessels, by the Government, however, all sorts of opium are to be found, and even without any attempt at very close buying, it is difficult to avoid this "prize opium," as it is technically called. The price of strictly prime Smyrna opium at the beginning of the year, (Sept., 1862,) was about $7.25 per pound. From this it arose with numerous fluctuations until March, when it reached $11.00, and from that point declined to the present time, when it is sold at $8.75, or thereabout, but has been as low as $8.10. Thirteen cases purchased with fair average distribution throughout the year, cost an average of $8.50, the lowest price paid being $7.31, and the highest, $11.00. This average is, however, by chance below that of the general market for the year."

To give an idea of the quality of leading pharmaceutical preparations, the Chairman obtained samples of six kinds from each of four of the principal cities of the Atlantic States, and subjected them to assay. These were Ether, Ether Fortior, Chloroform, Sweet Spt. Nitre, Hoffman's Anodyne and Laudanum, we quote in reference to two of them as follows:—

"*Sweet Spirit of Nitre.* The Spiritus Ætheris Nitrici of the old Pharmacopœia, and Spiritus Ætheris Nitrosi of the new.

Eleven specimens of this preparation, probably representing the entire supply of the market, were carefully and thoroughly examined, by a good process of assay, for the proportion of nitrous ether contained in them. The officinal preparation is a solution of nitrous ether in alcohol, and the solution contains 5 per cent. by volume of the nitrous ether, this being the medicinal agent, whilst the alcohol is added merely to dilute and preserve the ether. The s. g. of the officinal spirit is ·837 when freshly made, but increasing a little by age. The specific gravities of the specimens were ·893, ·906, ·876, ·898, ·934, ·852, ·847, ·852, ·858, ·848, and ·850. Not one of them being any where near the standard.

They severally contained the following percentage by volume of nitrous

ether, namely, 2, 2, less than 1, 2·5, less than 1, 2·25, 2·3, 2·4, 1·5, 1·5, per cent. Thus not one single specimen contained as much as half the officinal proportion of nitrous ether, though three of them came pretty nearly up to half strength. Of the remainder none exceed two-fifths, and five are below two-fifths, and do not average one-fourth strength. The prices paid for these were 17 c., 20 c., 20 c., 20 c., 25 c., 30 c., unknown, unknown, unknown, 55 c., and 40 c., per pound, and as usual, there is no relation between price and quality, that sold at 40 c., containing 1·5 percent., and that sold at 17 c., containing 1 per cent. of nitrous ether. A little more than seven years ago, the Chairman of this Committee went over this ground in a similar manner, and published the results. These were about the same as those now obtained, showing that there has been no improvement whatever in the market for this article during that time. The preparation cannot be honestly nor properly made by the usual process, nor at the usual price at which it is sold, and all manufacturers know this perfectly well, and yet go on, regardless of of anything but the profits to be realized by their dishonesty; and pharmaceutists, though repeatedly appealed to on behalf of this and other preparations, knowingly continue to dispense them.

Compound Spirit of Ether. The Spiritus Ætheris Compositus of the Pharmacopœia, or Hoffman's Anodyne. Eleven specimens of this preparation were examined. Not one of these was officinal in any single respect, nor in any degree, and not one contained any true heavy oil of wine. One specimen professed, by the label, to be strictly officinal. This answered most of the officinal tests, and certainly contained some compound of sulphuric acid in small proportion, but whatever this was, it was not the officinal heavy oil of wine, nor in the officinal proportion. This, therefore, was probably a strictly fraudulent preparation, got up carefully and skilfully for the purpose of deception, and is calculated to deceive, except that the delicate characteristic fruity odor of heavy oil of wine is absent. This, however, would only be likely to be detected by comparison, by those not very familiar with the officinal article. It is curious that this specimen appears to have been made by the same manufacturer as the very best specimen of Ether Fortior. Four of the other specimens contained light oil of wine enough to render water milky, and were so nearly alike in other respects, as to render it probable that they came from the same manufactory. All the specimens, except that specially alluded to above, were mere mixtures of dirty ether, generally in less than the officinal proportion, with dilute alcohol, and were probably made from the residue in rectifying ether. The prices charged for these were 75 c., 25 c., 25 c., 25 c., 30 c., 30., 38 c., unknown, unknown, 50 c., and 25 c., all except one being far below one-half of the neat cost of making the officinal article, and a great majority of pharmaceutists are aware of this fact.

Laudanum—The Tinctura Opii of the Pharmacopœia. It was thought by the Committee that it would be well to examine a represenative from the class of Tinctures; and this one was selected for its primary importance, its simplicity, and the facility with which opium of good quality can always be obtained when desired, An accurate morphia assay is, however, one of the most difficult in the whole domain of ordinary research, requiring more time and skill than was at the command of the Committee. It was therefore determined by experiment that a uniform process for precipitating all the alkaloids could be adopted and relied upon as giving a tolerable close comparison of the narcotic value of the specimens to which it was applied. Fifty cubic centimeters of the Standard Tincture of the Pharmacopœia yielded 0·604 grammes of mixed alkaloids by the process adopted. Eleven specimens, treated precisely in the same way,

gave the following results, namely: ·424, ·347, ·343, ·308, ·486, ·468, ·480, ·427, ·340, ·338, and ·357. These figures indicate that one of the specimens is but just about half strength. Five are in the neighborhood of seven-twelfths, and the remaining five vary between eight and ten-twelfths of the officinal strength.

These preparations cost 1·00, 1·00, 1·12, 1·00, ·88, 1·06, unknown, unknown, unknown, 1·12, and 1·00 per pound.

Opium by the case, in the hands of the importers, has brought an average price of at least $8·50 per pound throughout the past year, and this opium in drying loses an average of 20 per cent. in weight and there are but about 14½ troy ounces in the avoirdupois pound, while each pound of the officinal Tincture represents 1¼ troy ounces of dried and powdered opium. Therefore, at the neat cash price of opium, the quantity represented in a pound of properly made tincture costs over one dollar. Now upon the theory that druggists are generally honest, and are selling their tinctures below the neat cost of the principal ingredient, regardless of cost of menstruum, time, labor, and general expenses,—to say nothing of profits,—this preparation may be all right if the above results of examination be all wrong. But if this theory be too absurd for general credence, then these druggists and pharmacuetists are chargeable in their practice with an amount of dishonesty which, in the shape of a more bold and manly variety of robbery, would be likely to restrict their opportunities of wrongdoing to the narrower sphere of the criminal prisons.

From this exhibition of the character of six prominent represenative preparations from the market of the class to which they belong, it appears that although not one of them comes fully up to the officinal standard, yet that, by a liberal admission, two of the most important ones may be considered to be nearly right, and to be progressing in the desired direction of becoming entirely right. The three important ones of the remaining four, however, exhibits a low character discreditable alike to the professions of medicine and pharmacy, and to human nature in general; and those pharmaceutists whose moral perceptions at this day are left keen enough to appreciate the condition of their art, and whose energy is sufficient, certainly have a most enviable reputation and standing within their reach, by opposing the condition of things thus indicated, through what appears to be the rarely trodden path of moral rectitude. Let some of us then try how it will pay to be right where many are wrong, and try what the profits of such a new drug market will be."

Of the special reports and essays, several have been printed in our last number, and in this, including the paper of the late Professor Thomas on Sanguinarina as a representative of Bloodroot in therapeutics. This is, so far as we are aware, the last paper written by the lamented author, and exhibits the thorough manner usual with him in such investigations. Prof. Mayer's paper on the active principles of the Strychnaceæ possesses much interest and exhibits the relative proportions of Strychnia and Brucia in the drugs and some of their preparations.

The paper by the Editor of this Journal on Fluid Extracts is intended as a revision of a former paper by the same author in the Proceedings of 1859. Other papers by F. Bringhurst on Oxides of Iron, Maisch on Tartaric Acid and American SO^3HO, Scattergood on Marl as a source of potash, F. Stearns on Æsthetical Pharmacy, and Parrish on the Revenue Law, etc., are well written papers, and in various ways, add to the usefulness and interest of the work.

The Editor, Alfred B. Taylor, has done his work well, and so far as we have examined, the volume has been passed through the press more correctly than any of its predecessors. This should compensate for the delay in its appearance. It has been usual for the Executive Committee to fix the price and note it in the preparatory remarks, which has not been done. The printing and paper compare favorably with the preceding volumes.

A Treatise on Pharmacy designed as a text-book for the Student, and as a Guide for the Physician and Pharmaceutist, containing the officinal and many unofficinal formulas, and numerous examples of extemporaneous prescriptions. By Edward Parrish, Graduate in Pharmacy, &c. Third edition, thoroughly revised and improved with important additions, with 238 illustrations. Philadelphia: Blanchard & Lea, 1864, pp. 850.

Our readers are too well acquainted with the previous editions of this book to need any general description of its construction. We will, therefore, in remarking on what is new in the work, indicate the more important changes, or improvements and additions. Up to the chapter on tinctures, the alterations, etc., are not extensive. Here we have a new feature. Under the name of "Working Formulæ," the formulæ of the U.S. Pharmacopœia are introduced in groups under each head, with little, if any, comments, and these are followed by various unofficinal recipes, in the same manner. This is a decided improvement on the last edition, enabling the reader to use the book in lieu of the Pharmacopœia during reference or comparison of the unofficinal formulæ with the officinal. Tinctures, wines, vinegars, infusions, etc., are all grouped together as consequents of the processes of solution, a description of which precedes them.

The next groups of preparations requiring heat they are prefaced by a chapter on the generation of heat for pharmaceutical purposes. The author confines himself chiefly to lamp and gas heating arrangements, of which he gives many illustrations, referring the reader to works on manipulation for furnace arrangements. With entire approval of this chapter as far as it goes, we cannot but regret that the author did not see the need in a *treatise*, as he now claims this to be, of giving at least the simpler furnace arrangements and manipulations to be used in illustration of those formulæ where such instruments are called for in officinal recipes. On the other hand we advocate, to the utmost extent, the use of gas in such operations as syrup-making and evaporations in quantities not too extended for the scope of a shop counter. The classes are extracts, fluid extracts, oleoresins, syrups, the solid preparations of sugar lozenges, etc. The formulæ of the U. S. Pharmacopœia and many unofficinal recipes are here detailed. We cannot withhold a little criticism in reference to the author's manner of treating his subject. Instead of accompanying

each "working formula" by a suitable commentary, throwing light on peculiarities of the process, if any exist, or giving explanations of manipulations that to the student or beginner may appear obscure or unmeaning, he prefers to give a running commentary in preliminary remarks often of a general or abstract character, without, in the least degree, explaining the processes. This remark applies more pointedly to the Pharmacopœia preparations, as many of the unofficinal recipes have a paragraph in addition.

Chapter xvi. entitled "Extracta resina" and "concentrated remedies," savors so much of "Eclecticism," as to call forth a remark. The text of the chapter consists of the three officinal resins of Jalap, Podophyllum, and Scammony. The propriety of so far recognising such compounds as "Asclepidin," "Barosmin," "Cerasein," is much to be doubted. It is time enough to recognise preparations of which a formula has been published and tried, but to notice such as the above, is on a par with introducing a list of the panaceas, alteratives, and other quackery of the day. The book of "Dr. Coe" is written expressly to introduce the class of nostrums of which it treats, just as any ordinary quack would write a pamphlet to expound all the points in the history of his preparation, except the formula and composition.

The subject of distillation receives only a slight notice in chapter xvii. The author deems it out of place to devote much space to this operation in reference to the complex apparatus of the manufacturing laboratory, as not appropriate to works of the scope of this. The importance of distillation, as a branch of pharmaceutical manipulations, is greater now than ever before in relation to the recovery of alcohol, yet this is one of its simplest objects. There are so many cases where the operation is needed, requiring judgment for its correct adaptation, and a little more detail would have been useful. As a preliminary to the chapters on inorganic chemistry, retort distillation is noticed with various refrigerating arrangements. As an appendix to chapter xvii., the author has introduced recipes for a variety of fancy odors and toilet articles, mouth washes, sachets, pastilles, etc., which, in the opinion of many, will add to the value of the book as a formulary.

Part third is entitled Inorganic Chemistry, and embraces about 176 pages of closely printed matter. The author has aimed to embrace within this space notices of nearly all the inorganic chemicals used in medicine, and their preparations, arranged in groups as elements, acids, alkalies, earths, and metals. This will be found a useful part of the work, bringing, as it does, so many preparations not usually found in close groups together, when they can be consulted quickly. The Pharmacopœia processes for chemicals are introduced. The appendage of hints of the therapeutical objects, applications, and the doses of these preparations will be found by no means the least useful part of this division.

Part IV. is "Pharmacy in its relations to Organic Chemistry." Nearly

200 pages are devoted to this subject. In the first edition, it occupied 90 pages; in the second 156 pages. Whilst in former editions, Part iv. was devoted to inorganic chemicals, being preceded by the organic in the third edition, this has been reversed in accordance with the usual arrangement of *chemical* treatises. Most standard pharmaceutical works, however, observe the former order. The arrangement adopted for this part of the work is simple and appropriate for reference, commencing with the carbohydrates, alcohols, ethers, fixed oils volatile oils, and resins, acids, alkaloids, and neutral active principles. The author justly claims this and the preceding division to be the scientific portion of his work, and which, "by the valuable assistance of Prof. J. M. Maisch, has been rendered still more accurate, and brought up to the existing state of Chemical Science." With the old title of "Introduction to *practical* Pharmacy," much that is in this division would be out of place, but it is observed that the book is now called "*A treatise on Pharmacy*," etc. The propriety of introducing so much purely scientific matter into a work designed for the practical apothecary, might well be doubted; but the author claims a wider scope for his book, calling it a *text-book* for the student and a *guide* to the physician and pharmaceutist, and there is no information in it that is not useful, practically, or by way of accomplishment, to the pharmaceutist. There is a tendency, often observed, when a book addressed to any large class of readers proves successful, to increase its scope by introducing everything likely to add to its value as a store-house of facts. The U. S. Dispensatory has in this way become very comprehensive, and our author, though in a different manner, has adapted the same course, The work is essentially a compilation, built up from the journals and current literature of pharmacy and chemistry, and adapted to the wants of the classes for whom it is written by simplicity of arrangement and great absence of technicality, except in the third and fourth divisions where it is necessary to express tersely much information by means of symbols. In looking over the work for the impress of the author's individuality, we find it more in a sort of generalizing commentary, running throughout the pharmaceutical part of the work than in any systematic elimination of his opinions of the various formulæ based on practical experience. This is a desideratum yet to be attained in English or American pharmacy, and an idea of which is conveyed most forcibly in the little translation of Wittstein by Darby.

The last and fifth part of the book is entitled "Extemporaneous Pharmacy." The first portion of this is devoted to the art of prescribing, so far as it relates to writing prescriptions, and selecting and combining medicines. The other chapters embrace notices of powders, pills, suppositories, mixtures, styptics, collyria, anemata, gargles, ointments, cerates, plasters, etc., including many formulas for each of these preparations, making this part of the book almost a formulary for extemporaneous preparations.

The final chapter is on dispensing and compounding prescriptions, and

the arrangements of the shop and counter most favorable for carrying out the processes of dispensing; including pill making, plaster spreading, suppository moulding, etc. No part of the work contains the impress of the author's style more than this, and its precepts will be found highly valuable by a numerous class of readers, including medical and pharmaceutical students, and illy educated proprietors of stores, who have embarked in the important and responsible business of dispensing, with less knowledge of pharmacy than a militia man knows of the art of war.

In taking a retrospective glance at the pages we have gone over, we are conscious of the presence of many points that might be improved, of some formulæ that might have been omitted, and of some chapters that need extending. Our time has not permitted to examine the typographical correctness of the great part of the work to see if it has escaped errors of the press, yet, in the examination we have given it, none of much importance have been detected. As a whole we believe it to be a very useful handbook for the apothecary, and deserving of his patronage; whilst there is so much within its covers valuable to the physician, that it may well occupy a place on his shelf for books of daily reference. The publisher's part has been well executed.

OBITUARY.—Died on the 3d of February, 1864, DR. ROBERT P. THOMAS, Professor of Materia Medica, in the Philadelphia College of Pharmacy, aged 43 years. This melancholy event, which has cast a gloomy shadow over the interests of our College, occurred very suddenly, the sufferer being stricken down by spotted fever within twelve hours from the conclusion of his last lecture, and he survived the blow but thirty-six hours. Dr. Thomas was suffering slightly from a cold, and was undoubtedly depressed at the time of his seizure, which was almost immediately followed by insensibility and spasms, from which he did not recover until death closed the scene.

Dr. Thomas was elected to the Chair of Materia Medica in 1850. His abilities as a teacher of that branch have been constantly in the ascendant, and at the period of his decease he was undoubtedly one of the ablest lecturers on Materia Medica in the United States. An association of many years has endeared him to his colleagues and the members of the College generally, for his genial and social qualities, and for his valuable services to their institution, both as a teacher and a member. His class have deeply felt his loss, and by resolutions at page 180, that portion of them constituting the Zeta Phi Society give a voice to their feelings.

As the resolutions passed by the College (see page 180), direct the appropriate committee to prepare an obituary notice of the deceased, we withhold further remark on his past life, marked as it was with much to encourage the student to persevere in holding fast to his integrity.

PROF. FRANKLIN SCAMMON died at Chicago, Illinois, on the 10th of February, 1864, after a painful and protracted illness.

Dr. Scammon was the son of Hon. Eliakim Scammon, of East Pittston, Kennebec County, Maine. He was born in Whitefield, Lincoln County, Maine, October 23, 1810, and was in his 54th year. In early life he was an apothecary in Hallowell, Maine, but afterwards studied medicine, graduated in Philadelphia, and practiced Medicine in Hallowell. In 1850, he removed to Chicago, where, in various capacities, he continued to reside until his death. Dr. Scammon at the institution of the Chicago College of Pharmacy several years ago, became its President and one of its Professors. His tastes were scientific, and Botany particularly received his attention, being considered one of the ablest botanists of the West. A year or two before his death, Prof. Scammon was elected to the botanical chair in the University of Chicago, and discharged his duties last year with ability. He was maturing a plan for a Botanical Garden at the time of his decease. He was a remarkably kind, considerate, and just man; his loss will be particularly felt by his friends, as well as at the Academy of Science, of which he was an active member, and at one time its President. His life has been one of active usefulness, and his death is represented to have been such as becomes the true Christian.

Frederick Brown, Pharmaceutist, of Philadelphia, died on the 27th of February, 1864, in the 68th year of his age, of a painful illness from which he has been suffering for several months.

Mr. Brown entered the establishment of the late Charles Marshall, about the year 1812, and commenced his business in the year 1820, at the corner of 5th and Chestnut Streets, where it has ever since been conducted. He was one of the earliest members of the College of Pharmacy, but never took an active interest in its affairs. As a pharmaceutist he was one of the first to adopt the modern methods of conducting the business, and his establishment always enjoyed a good reputation, which in no small degree was owing to his personal popularity with his patrons.

As a business man, Mr. Brown possessed more than ordinary ability, uniting enterprize with cautiousness in operating, which lead him to wealth. In public life he was connected with the banking and other public and benevolent institutions, to which he gave much of his time and attention, but so far as we know, his tendencies never assumed a scientific direction. Those who knew Mr. Brown best, speak of him as generous in his business relations with other druggists, and charitable to the needy. He leaves a widow, a daughter, and three sons, one of whom he had recently associated with himself in business, and who will be his successor.